Note remarks

: DAF 6,2 p 1 Test sheet Edition : 31.08,90 : 8.9.89 Replaces

Test oil : ISO-4113

Combination no. ± 0 400 846 537

Injection pump

Pump designation : PES6A95D32ORS2693Z

: 0 410 896 913 EP type number

Governor

Governor design. : RQ300/1300AB1204R

: 0 420 20, 640 Governer no.

Customer-spec. information

: DAF Customer

: DNS 620 Engine

: 150.0 1st version kW : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening .

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 7.50...10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference ° CS : 2.50...3.50

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 12.00...12.10

Del.guantity cm3/: 8.7...8.8

100 s: (8.5...9.0)

cm3 : 0.3Spread

100 s: (0.6)

rom : 300.02nd speed

Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 0.7...1.1

100 s: (0.4...1.3)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-Lever position Degree: -2

rpm : 800 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm:850Aneroid pressure h: 700

: 87.5...88.5 Del.quantity

1000 : (85.5...90.5)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm

Rack travel in mm: 20.0

A01

Testing: 1st rack travel in: 10.70 rpm : 1345...1360 Speed 2nd rack travel in: 4.00 rpm : 1425...1455 Speed 4th rack travel in: 1550 rpm : 0.00...1.00 Speed LOW IDLE 1 Setting point w/out bumper spring : 300 Speed rpm Rack travel in mm : 6.7 Testina: Speed rpm : 100 Minimum rack trave: 8.00 : 300 Speed rpm Rack travel in mm : 6.60...6.80 Rack travel in mm: 2.00 rpm : 540...580 Speed TORQUE CONTROL Dimension a mm : 0.55 Torque control curve - 1st version rpm : 1290 îst speed Rack travel in m: 11.60...11.80 : 850 2nd speed rpm Rack travel in m: 13.00...13.40 : 935 3rd speed rpm Rack travel in m: 12.70...13.10 4th speed rpm : 1080 Rack travel in m: 11.90...12.20 Aneroid/Altitude Compensator Test 1st version Settina : 600 Speed rom Pressure hPa : 700 Rack travel mm : 12.00...12.10 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.90...11.10 2nd pressure hPa : 290 Rack travel in m: 11.80...11.90 3rd pressure hPa : 265 Rack travel in m: 11.30...11.50 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 700 Speed : 1290 rpm Del.quantity cm3/: 88.0...90.0 1000 s: (85.5...92.5) Aneroid pressure h: -: 600 Speed rpm Del.quantity cm3/: 65.5...66.5 1000 s: (63.5...68.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1345...1360 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 130.0...145.0 1000 s: (127.0...148.0) Rack travel in mm : 19.50...21.00 LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.60...6.80
Del.quantity cm3/ : 7.0...11.0
1000 s: (4.5...13.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

When adjusting the governor, observe service information on microcard W-400/008/D15

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : IHC 7,6 w 3 Test sheet : 05.10.90 Edition Replaces : ISO-4113 Test oil Combination no. : 0 400 846 578 Injection pump Pump designation : PES6A95D32ORS2779 : 0 410 896 903 EP type number Governor : RQV350...1200AB1236-Governor design. 7R : 0 420 213 119 Governer no. Customer-spec. information : NAVISTAR Customer : DT 466 Engine : 145.0 1st version kW Rated speed : 2400 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 038 Inlet press., bar: 2.80 Test nozzle holder assembly : 1 688 901 110 Openina : 250...253 pressure, bar Orifice plate : 0,5 diameter mm Test lines : 1 680 750 008 Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 1-5- 3- 6- 2- 4 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75)Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1200 Rack travel in mm : 13.50...13.60 Del.quantity cm3/: 10.1...10.3 100 s: (9.9...10.5) cm3 : 0.3Spread 100 s: (0.6) rpm : 350.02nd speed Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.7...2.1 100 s: (1.5...2.3) cm3 : 0.3Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1400 8.60...9.00 travel mm rpm : 1250 : 7.30...7.50 rpm : 550 2nd speed travel mm 3rd speed : 3.10...3.70 travel mm : 350 4th speed rpm : 1.30...1.70 travel mm FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1200 Speed Aneroid pressure h: 900 : 101.5...103.5 Del.quantity 1000 : (99.5...105.5) : 3.50 Spread cm3 : (6.00) 1000 RATED SPEED

Prestroke mm

Rack travel in mm : 10.50

: 2.65...2.75 : (2.60...2.80) 1st version Control lever

position degrees: 41...49

Testing:

1st rack travel in: 12.50 rpm : 1230...1260 Speed

2nd rack travel in: 4.00

rpm : 1385...1395 Speed

4th rack travel in: 1500

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 11...19

Testina:

Speed : 100 rom Minimum rack trave: 9.00 rpm : 350 Speed

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

Speed rpm : 350...500

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rom hPa : 900 Pressure

: 13.50...13.60 Rack travel mm

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 9.80...10.00

2nd pressure hPa : 225

Rack travel in m: 10.80...10.90

3rd pressure hPa : 500

Rack travel in m: 12.40...12.80

START CUT-OUT

1/min: 270 (280) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/: 73.0...77.0
1000 s: (71.0...79.0)

BREAKAWAY

A04

1st version 1mm rack travel less than

full load rack tr: 12.50

rpm : 1230...1260 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 16.20...17.00

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 17.0...21.0 1000 s: (15.0...23.0)

cm3 : 3.50 Spread

1000 s: (5.50)

Remarks:

: NAVISTAR #1815517C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of

delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.65...2.75 : (2.60...2.80) Rack travel in mm: 10.50 Note remarks : 1-5-3-6-2-4 Firing order : IHC 7,6 y Test sheet : 05.10.90 Edition Replaces : 8.6.90 : 0-60-120-180-240-300 Test oil : ISO-4113 Phasing : 0.50 (0.75) : 0 400 846 579 Tolerance + - ° Combination no. Time to cyl. no. Injection pump Pump designation : PES6A95D32ORS2779 BASIC SETTING EP type number : 0 410 896 903 Governor : RQV350...1350AB1248R rpm: 1350 Governor design. 1st speed Governer no. : 0 420 215 120 Rack travel in mm : 12.30...12.40 Customer-spec. information Del.quantity cm3/: 8.4...8.6 : NAVISTAR Customer 100 s: (8.2...8.8) : DT 360 Engine cm3 : 0.3: 126.0 Spread 1st version kW : 2700 Rated speed 100 s: (0.6) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0Rack travel in mm: 5.9...6.1 Test oil Del.quantity cm3/: 1.7...2.1 100 s: (1.5...2.3) inlet temp. °C : 38...42 cm3 : 0.3 Overflow valve Spread : 2 417 413 038 100 s: (0.5) (B) Setting of injection pump Inlet press., bar: 2.80 with governor Test nozzle holder : 1 688 901 110 GUIDE SLEEVE TRAVEL assembly 1st speed rpm : 1350: 7.30...7.50 rpm : 1460 travel mm Opening 1 : 250...253 2nd speed pressure, bar travel mm rpm : 550 Orifice plate 3rd speed : 0,5 diameter mm travel mm rpm : 350 4th speed travel mm Test lines : 1 680 750 008 Outside diameter x Wall thickness 1st version rpm : 1350 x Length mm : 6.00x2.00x600 Speed Aneroid pressure h: 900 Del.quantity (A) Injection pump setting values Insp. values in parentheses

: 8.10...8.50 : 3.10...3.70 : 1.30...1.70 FULL LOAD DELIV. AT FULL LOAD STOP : 84.0,..86.0 1000 : (82.0...88.0) : 3.50 Spread cm3 : (6.00) 1000 RATED SPEED 1st version

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Control lever

position degrees: 44...52

Testina:

1st rack travel in: 11.30

rpm : 1390...1420 Speed

2nd rack travel in: 4.00

Speed rpm: 1525...1535 4th rack travel in: 1625

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 11...19

Testing:

Speed : 100 rpm Minimum rack trave: 9.00

rpm : 350 Speed

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 350...500 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 hPa : 900 Pressure

Rack travel mm : 12.30...12.40

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 9.20...9.40

2nd pressure hPa : 240

Rack travel in m: 10.00...10.10

3rd pressure hPa : 445

Rack travel in m: 11.20...11.60

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 61.5...65.5

1000 s: (59.5...67.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.30

: 1390...1420 Speed rom

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...155.0 1000 s: (130.0...160.0)

Rack travel in mm : 16.20...17.00

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 17.0...21.0 1000 s: (15.0...23.0)

cm3 : 3.50Spread 1000 s: (5.50)

Remarks:

: NAVISTAR #1816726091

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of

delivery of cylinder 1

Note remarks

Test sheet : DAF 6,2 s Edition : 14.09.90

Replaces

Test oil : ISO-4113

Combination no. : 0 400 846 582

Injection pump

Pump designation : PES6A95D32ORS2796

: 0 410 896 901 EP type number

Governor

Governor design. : RQ300/1300AB1253-2R.

: 0 420 20, 653 Governer no.

Customer-spec. information Customer : DAF

: NS 156G Engine

: 156.0 1st version kW : 2600 Rated speed

TEST DENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 7.50...10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference ° CS : 2.50...3.50

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 8.3...8.4

100 s: (8.1...8.6)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.0 2nd speed

Rack travel in mm : 6.4...6.6 Del.quantity cm3/: 0.7...1.1

100 s: (0.4...1.3)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 800 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

: 83.5...84.5 1000 : (81.5...86.5) Del.quantity

: 3.50 cm3 Spread

: (6.00) 1000

RATED SPEED

1st version

Setting point:

Speed rpm

Rack travel in mm: 20.0

Testing: 1st rack travel in: 11.40 Speed rpm : 1320...1330 2nd rack travel in: 4.00 Speed rpm : 1400...1430 4th rack travel in: 1550 rpm : 0.00...1.00 Speed LOW IDLE 1 Setting point w/out bumper spring rpm Rack travel in mm: 6.5 Testing: : 200 Speed rpm Minimum rack trave: 6.40 : 300 Speed rpm Rack travel in mm : 6.40...6.60 Rack travel in mm: 2.00 Speed rpm : 545...585 TORQUE CONTROL Dimension a mm : 0.60 Torque control curve - 1st version rpm : 1290 1st speed Rack travel in m: 12.20...12.60 : 750 2nd speed rpm Rack travel in m: 13.90...14.50 rpm : 960 3rd speed Rack travel in m: 13.30...13.90 4th speed rpm : 1055 Rack travel in m: 12.40...13.20 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 600 hPa : 1000 Pressure : 12.70...12.80 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : -Rack travel in m: 11.60...11.80 2nd pressure hPa : 280
Rack travel in m: 12.40...12.50
3rd pressure hPa : 250 Rack travel in m: 11.90...12.10 START CUT-OUT

1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 1290
Del.quantity cm3/: 85.0...87.0
1000 s: (82.5...89.5)
Aneroid pressure h: Speed rpm : 600
Del.quantity cm3/: 57.5...58.5
1000 s: (55.5...60.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.40 Speed rpm : 1320...1330

LOW IDLE

pread cm3 : 3.50 1000 s: (5.50)

Remarks:

Speed

Note remarks

: DAF 6,2 p 3 Test sheet Edition : 14.09.90

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 846 583

Injection pump

Pump designation : PES6A95D32ORS2693Z

: 0 410 896 913 EP type number

Governor

Governor design. : RQ300/1300AB1253R

: 0 420 20, 649 Governer no.

Customer-spec. information

Customer : DAF

Engine : NS 156

1st version kW : 156.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 7.50...10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 8.5...8.6

100 s: (8.3...8.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 6.0...6.2

Del.quantity cm3/: 0.7...1.1

100 s: (0.4...1.3)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 1000 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 700

: 85.5...86.5 1000 : (83.5...88.5) Del.quantity

: 3.50 cm3 Spread

: (6.00) 1000

RATED SPEED

1st version

Setting point:

: 1000 rpm Rack travel in mm : 20.0

A09

Testina: 1st rack travel in: 10.90 Speed rpm: 1325...1340 2nd rack travel in: 4.00 rpm : 1420...1450 Speed LOW IDLE 1 Setting point w/out bumper spring : 300 rom Rack travel in mm: 6.1 Testing: Speed rpm : 200 Minimum rack trave: 6.80 : 300 rpm Speed Rack travel in mm : 6.00...6.20 Rack travel in mm : 2.00 : 530...570 Speed rom TORQUE CONTROL Dimension a mm :-Torque control curve - 1st version rpm : 1280 1st speed Rack travel in m: 11.90...12.00 2nd speed rpm : 750 Rack travel in m: 11.90...12.10 Aneroid/Altitude Compensator Test 1st version Settina : 600 Speed rom Pressure hPa : 700 : 11.90...12.00 Rack travel mm Measurement Speed  $1/\min : 600$ 1st pressure hPa : -Rack travel in m: 10.30...10.50 2nd pressure hPa : 290 Rack travel in m: 11.50...11.60 3rd pressure hPa : 250 Rack travel in m: 10.70...10.90 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.90 Speed rpm : 1325...1340

LOW IDLE

Speed rpm : 300 Rack travel in mm : 6.00...6.20 Del.quantity cm3/ : 7.0...11.0 1000 s: (4.5...13.5)

Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

A10

Speed

1st version

Aneroid pressure h: -

rpm : 600

1000 s: (51.5...56.5)

Del.quantity cm3/: 53.5...54.5

Note remarks

Test sheet : DAF 6,2 p 4 Edition : 28.09.90

Replaces : -

Test oil : ISO-4113

Combination no. : 0 400 846 585

Injection pump

Pump designation : PES6A95D32DRS2693 EP type number : 0 410 896 914

Governor

Governor design. : RQ300/1300AB1253-1R

Governer no. : 0 420 20, 650

Customer—spec. information Customer : DAF

Engine : NT 133

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 7.50...10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00

Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 7.1...7.2

100 s: (6.9...7.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm: 300.0

Rack travel in mm : 6.6...6.8 Del.quantity cm3/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm3: 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm: 800

Rack travel in mm: 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 850 Aneroid pressure h: 700

Del.guantity : 71.5...72.5

1000 : (69.5...74.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm: 800

Rack travel in mm : 20.0

Testina:

1st rack travel in: 9.50

rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1410...1440 Speed 4th rack travel in: 1550 Speed rpm : 0.00...1.00 LOW IDLE 1 Setting point w/out bumper spring Speed rpm: 300 Rack travel in mm: 6.7 Testing: rpm : 100 Speed Minimum rack trave: 8.00 rpm : 300 Rack travel in mm : 6.60...6.80 Rack travel in mm : 2.00 : 540...580 Speed rom TORQUE CONTROL Dimension a mm : 0.55 Torque control curve - 1st version rpm : 1290 1st speed Rack travel in m: 10.40...10.60 rpm : 900 2nd speed Rack travel in m: 11.50...11.60 rpm : 1000 3rd speed Rack travel in m: 11.00...11.40 4th speed rpm : 1070 Rack travel in m: 10.60...10.90 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 600 Pressure hPa : 700 Rack travel mm : 11.20...11.30 Measurement Speed  $1/\min : 600$ 1st pressure hPa : -Rack travel in m: 10.40...10.60 2nd pressure hPa : 255 Rack travel in m: 10.70...10.80 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700

rpm : 1290

Del.quantity cm3/: 71.0...73.0 1000 s: (68.5...75.5) Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 50.5...51.5 1000 s: (48.5...53.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.50 rpm : 1340...1350 Speed STARTING FUEL DELIVERY : 100 Speed rom Rack travel in mm : 19.50...21.00 LOW IDLE rpm : 300 Speed Rack travel in mm : 6.60...6.80 Del.quantity cm3/ : 7.0...11.0

1000 s: (4.5...13.5)

cm3 : 3.50

1000 s: (5.50)

Remarks:

Spread

A12

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.65...2.75 : (2.60...2.80) Rack travel in mm : 10.50 Note remarks : 1-5-3-6-2-4 Firing order Test sheet : IHC 7,6 z : 17.09.90 Edition Replaces : 0-60-120-180-240-300 : ISO-4113 Phasing Test oil : 0.50 (0.75) Combination no. : 0 400 846 587 Tolerance + - ° Time to cyl. no. : 1 Injection pump Pump designation : PES6A95D32ORS2779 EP type number : 0 410 896 903 BASIC SETTING Governor Governor design. : RQV350...1350AB1251R rpm: 1350 1st speed : 0 420 213 122 Governer no. Rack travel in mm : 12.20...12.30 Customer-spec, information Customer : NAVISTAR : DTA 360 Engine cm3 : 0.3: 138.0 Spread 1st version kW : 2700 Rated speed TEST BENCH REQUIREMENTS 2nd speed Test oil inlet temp. °C : 38...42 Overflow valve Spread : 2 417 413 038 Inlet press., bar: 2.80 with governor Test nozzle holder assembly : 1 688 901 110 GUIDE SLEEVE TRAVEL 1st speed **Openina** travel mm pressure, bar : 250...253 2nd speed travel mm rpm : 550 Orifice plate 3rd speed diameter mm : 0.5 travel mm rpm : 350 4th speed travel mm : 1 680 750 008 Test lines Outside diameter 1st version x Wall thickness Speed : 6.00X2.00X600 x Length mm Aneroid pressure h: 900 (A) Injection pump setting values

Del.guantity cm3/: 8.4...8.6 100 s: (8.2...8.8) 100 s: (0.6) rpm : 350.0Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 1.7...2.1 100 s: (1.5...2.3) cm3 : 0.3 100 s: (0.5) (B) Setting of injection pump rpm : 1350 7.30...7.50 rpm : 1460 : 8.10...8.50 : 3.10...3.70 : 1.30...1.70 FULL LOAD DELIV. AT FULL LOAD STOP rpm : 1350 : 84.0...86.0 Del.quantity 1000 : (82.0...88.0) : 3.50 cm3 Spread : (6.00) 1000 RATED SPEED 1st version

per values

Insp. values in parentheses

Set equal delivery quant.

Control lever position degrees: 44...52 Testing: 1st rack travel in: 11.20 Speed rpm : 1405...1435 2nd rack travel in: 4.00 Speed rpm: 1540...1550 4th rack travel in: 1650 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 11...19 Testina: Speed rpm : 100 Minimum rack trave: 9.00 : 350 Speed rpm Rack travel in mm : 5.90...6.10 CONSTANT REGULATION rpm : 350...500 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 1350 1st speed Rack travel in m: 12.20...12.30 : 850 2nd speed rpm Rack travel in m: 13.20...13.30 rpm : 1175 3rd speed Rack travel in m: 12.50...12.70 th speed rpm : 1050 Rack travel in m: 13.20...13.30 4th speed Aneroid/Altitude Compensator Test 1st version Settina Speed : 500 rom hPa : 900 Pressure : 13.20...13.30 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : -

Rack travel in m: 9.50...9.70 2nd pressure hPa : 220 Rack travel in m: 10.40...10.50

FUEL DELIVERY CHARACTERISTICS

1st version Ameroid pressure h: 900 : 850 Speed rpm

Del.quantity cm3/: 98.0...102.0 1000 s: (96.0...104.0)

cm3 : 5.00 1000 s: (7.00) Spread

Aneroid pressure h: -: 500 Speed rom

Del.quantity cm3/: 67.0...71.0

1000 s: (65.0...73.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.20

rpm : 1405...1435 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 145.0...165.0

1000 s: (140.0...170.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm

Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 17.0...21.0

1000 s: (15.0...23.0)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

: NAVISTAR #1817191C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of delivery of cylinder 1

Speed

3rd pressure hPa : 435

START CUT-OUT

Rack travel in m: 12.20...12.60

1/min : 270 (280)

Note remarks

Test sheet

: MWM 2,1 c

Edition

: 14.09.90

Replaces Test oil

: ISO-4113

Combination no. : 0 400 862 002

Injection pump

Pump designation : PES2A90D320/3RS2794

EP type number

: 0 410 892 001

Governor

Governor design. : RSV300...1000A7C505R

Governer no.

: 0 420 233 188

Customer

Customer—spec. information : MWM

Engine

: D226B-2

1st version kW

: 25.0

Rated speed

: 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening |

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.95...3.05

: (2.90...3.10)

Rack travel in mm : 9.00...12.00

A15

Firing order : 1- 2

Phasing

: 0-90

Tolerance + - °

: 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00 & maximum rack tra: 21.00 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed

rpm: 1000

Rack travel in mm : 11.50...11.60

Del.guantity cm3/: 8.5...8.6

100 s: (8.3...8.8)

Spread

cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 300.0 Rack travel in mm : 7.5...7.7 Del.quantity cm3/ : 1.2...1.8

100 s: (1.0...2.0)

Spread

cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1000

: 85.0...86.0

Deliquantity

1000 : (83.0...88.0)

: 3.00 cm3

1000 : (5.00)

RATED SPEED

Spread

1st version

Control lever

position degrees: 107...115

Testing:

1st rack travel in: 10.50 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1050...1080 Speed 3rd rack travel in: 4.00 Speed rpm : 1065...1095 4th rack travel in: 1220 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 67...75 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 5.7 Testina: : 100 Speed rpm Minimum rack trave: 19.50 : 300 rpm Speed Rack travel in mm : 6.10...6.30 Rack travel in mm : 2.00 Speed rpm : 335...395 TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 11.50...11.60 rpm : 500 2nd speed Rack travel in m: 11.50...11.70 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.50 rpm : 1040...1050 Speed STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 130.0...140.0 1000 s: (127.0...143.0) Rack travel in mm : 19.50...21.00 Remarks:

APPLICATION

Generator set

Note remarks

Test sheet : MWM 3,1 b 3 **Edition** : 05.10.90

Replaces

Test oil : ISO-4113

Combination no. : 0 400 863 018

Injection pump

Pump designation : PES3A90D320/3RS2658

: 0 410 893 004 EP type number

Governor

Governor design. : RSV300...1000A7C505R

Governer no. : 0 420 233 188

Customer-spec. information Customer : MWM

Engine : D226B-3

TEST BENCH REGUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm

: (2.90...3.10)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 3 Phasing : 0-120-240

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00

& maximum rack tra: 21.00 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 8.5...8.6

100 s: (8.3...8.8)

cm3 : 0.3Spread

100 s: (0.5)

2nd speed rpm : 300.0Rack travel in mm: 6.9...7.1
Del.quantity cm3/: 0.9...1.6
100 s: (0.7...1.8)

cm3 : 0.2Spread

100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 85.0...86.0 Del.quantity

1000 : (83.0...88.0)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 105...113

Testing:

1st rack travel in: 10.00

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

rpm : 1055...1085 Speed

3rd rack travel in: 4.00

Speed rpm : 1065...1095 4th rack travel in: 1220

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 65...73

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 5.6

Testing:

Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 300

Rack travel in nm : 6.00...6.20 Rack travel in nm : 2.00 Speed rpm : 335...395

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 11.00...11.10

2nd speed rpm : 500 Rack travel in m: 11.00...11.20

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.00

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 130.0...140.0 1000 s: (127.0...143.0)

Rack travel in mm : 19.50...21.00

Remarks:

APPLICATION

Generator set

Note remarks

: MWM 4,1 b 2 : 31.08.90 Test sheet Edition : 13.12.89 Replaces Test oil : ISO-4113

: 0 400 864 076 Combination no.

Injection pump

Pump designation : PES4A90D320/3RS2659

: 0 410 894 028 EP type number

Governor

Governor design. : RSV325...1250A0C2182

-7R

: 0 420 233 258 Governer no.

Customer-spec. information : MWM Customer

Engine : TD224/04

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05

: (2.90...3.10)

Rack travel in mm : 9.00...12.00 : 1-3-4-2 Firing order

: 0-90-180-270 Phasing

: 0.50 (0.75)Tolerance + - °

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 9.1...9.2

100 s: (8.9...9.4)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 325.02nd speed

Rack travel in mm : 7.0...7.2

Del.quantity cm3/: 0.8...1.4 100 s: (0.6...1.6)

cm3 : 0.2Spread

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed Aneroid pressure h: 700

Del.quantity

: 91.5...92.5 1000 : (89.5...94.5) cm3 : 3.00 Spread

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 45...53

Testina:

1st rack travel in: 10.50

rpm : 1290...1300 Speed 2nd rack travel in: 4.00 rpm : 1325...1355 Speed 3rd rack travel in: 4.00 rpm : 1340...1370 Speed 4th rack travel in: 1505 rpm : 0.30...1.40Speed LOW TDLE 1 Control Lever position degrees: 16...24 Setting point w/out bumper spring Speed rpm: 325 Rack travel in mm: 5.5 Testing: : 100 Speed rom Minimum rack trave: 19.50 : 325 Spead rpm Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 Speed rpm : 470...530 TORQUE CONTROL Torque control curve - 1st version rpm : 1250 1st speed Rack travel in m: 11.50...11.60 rpm : 500 2nd speed Rack travel in m: 12.60...12.70
3rd speed rpm: 890 Rack travel in m: 11.90...12.10 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 man hPa : 700 Pressure : 12.60...12.70 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.40...10.50 2nd pressure hPa : 185 Rack travel in m: 11.60...11.70 3rd pressure hPa : 90 Rack travel in m: 11.00...11.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 185 rpm\_ : 500 Speed

Del.quantity cm3/: 79.0...81.0 1000 s: (76.5...83.5) Aneroid pressure h: Speed rpm : 500
Del.quantity cm3/: 61.0...63.0
1000 s: (59.0...65.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.50 Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 132.0...142.0

1000 s: (129.0...145.0)

Rack travel in mm : 19.50...21.00

Remarks:

: STILL

Note remarks

: KHD 4,1 j : 21.09.90 Test sheet Edition : 5.3.90 Replaces : ISO-4113 Test oil

Combination no. : 0 400 864 077

Injection pump

Pump designation : PES4A95D410/3RS2789

: 0 410 894 995 EP type number

Governor

Governor design. : RSV325...1150A5C2244

: 0 420 232 536 Governer no.

Customer-spec. information : KHD Customer

: F4L913 Engine

1st version kW : 68.0 : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

: 1 680 750 014 Test Lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.10 Prestroke mm

: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 12.80...12.90

Del.quantity cm3/: 9.0...9.2

100 s: (8.8...9.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 325.0 2nd speed Rack travel in mm: 8.3...8.5 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

: 90.0...92.0 Del.quantity 1000 : (88.0...94.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 95...103

Testing:

1st rack travel in: 11.80

Speed rpm : 1190...1200 2nd rack travel in: 4.00

rpm : 1240...1250 Speed

3rd rack travel in: 4.00

rpm : 1250...1280 Speed 4th rack travel in: 1415 Speed rpm : 0.30...1.40LOW IDLE 1 Control Lever position degrees: 63...71 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm: 5.5 Testing: rpm : 100 Speed Minimum rack trave: 19.50 Speed rpm: 325
Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00 : 400...460 Speed rpm TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 12.80...12.90
2nd speed rpm : 500
Rack travel in m: 13.20...13.30
4th speed rpm : 1070 Rack travel in m: 13.00...13.20 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 750 Speed Del.quantity cm3/: 88.5...91.5 1000 s: (86.0...94.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.80 Speed rpm : 1190...1200 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 125.0...135.0 1000 s: (122.0...138.0) Rack travel in mm : 19.50...21.00

Remarks:

APPLICATION

Tractor (tractor engines)

Note remarks

Test sheet : MWM 4,1 b 4

: 17.09.90 Edition

Replaces

Test oil : ISO-4113

: 0 400 864 080 Combination no.

Injection pump

Pump designation : PES4A90D320/3RS2659

EP type number : 0 410 894 028

Governor

Governor design. : RSV300...1000A7C505R

Governer no. : 0 420 235 188

Customer-spec. information

Customer : MWM

: D226B-4 Engine

: 54.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm

: (2.90...3.10)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00 & maximum rack tra: 21.00 Difference ° CS : 3.50...4.50

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 8.8...8.9

100 s: (8.6...9.1)

cm3 : 0.3Spread

100 s: (0.5)

2nd speed rpm : 300.0 Rack travel in mm : 7.5...7.7

Del.quantity cm3/: 1.2...1.8 100 s: (1.0...2.0)

cm3 : 0.2

Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 88.5...89.5 Del.quantity

1000 : (86.5...91.5)

: 3.00 Spread cm3

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 107...115

Testing:

1st rack travel in: 10.50 rpm : 1040...1050 Speed 2nd rack travel in: 4.00

Speed rpm : 1050...1080 3rd rack travel in: 4.00

rpm : 1065...1095 Speed

4th rack travel in: 1220

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 67...75

Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 5.7

Testing:

Speed rpm : 100 Minimum rack trave: 19.50

Speed rpm: 300 Rack travel in mm: 6.10...6.30

Rack travel in mm : 2.00 Speed rpm : 335...395

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 11.50...11.60

2nd speed rpm : 500

Rack travel in m: 11.50...11.70

### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 10.50

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 130.0...140.0 1000 s: (127.0...143.0) Rack travel in mm: 19.50...21.00

Remarks:

APPLICATION

Generator set

Note remarks

Test sheet : KHD 1 0 6 Edition : 21.09.90

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 864 081

Injection pump

Pump designation : PES4A85D410/3RS2799

EP type number : 0 410 884 944

Governor

Governor design. : RSV325...1250A2C2253

: 0 420 232 547 Governer no.

Customer-spec. information Customer : KHD

: BF4L913 Engine

: 78.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test Lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.50...2.60 : (2.45...2.65)

Rack travel in mm : 9.00...12.00 : 1-3-4-2

Firing order

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 12.40...12.50

Del.guantity cm3/: 8.7...8.8

100 s: (8.5...9.0)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 325.02nd speed Rack travel in mm : 7.8...8.0

Del.quantity cm3/: 1.0...1.6 100 s: (0.8...1.8)

cm3 : 0.2Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 700

Del.quantity : 87.5...88.5 1000 : (85.5...90.5)

cm3 : 3.00 1000 : (5.00) Spread

RATED SPEED

1st version

Control lever

position degrees: 99...107

Testing:

1st rack travel in: 11.40

rpm : 1290...1300 Speed

2nd rack travel in: 4.00

: 1370...1400 Speed rom

3rd rack travel in: 4.00 rpm : 1395...1425 Speed 4th rack travel in: 1560 Speed rpm : 0.30...1.40LOW IDLE 1 Control lever position degrees: 69...77 Setting point w/out bumper spring : 325 rpm Rack travel in mm: 5.5 Testing: rpm : 100 Speed Minimum rack trave: 19.50 : 325 Speed rpm Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 : 560...620 Speed rom TORQUE CONTROL Torque control curve - 1st version rpm : 1250 1st speed Rack travel in m: 12.40...12.50 d speed rpm : 500 2nd speed Rack travel in m: 13.10...13.20 rpm : 1010 4th speed Rack travel in m: 12.70...12.90 Aneroid/Altitude Compensator Test 1st version Settina : 500 Speed rpm hPa : 700 Pressure : 13.10...13.20 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 11.60...11.70 2nd pressure hPa : 280 Rack travel in m: 12.00...12.10 FUEL DELIVERY CHARACTERISTICS 1st version

Aneroid pressure h: 700 Speed rpm : 750
Del.quantity cm3/: 88.0...90.0
1000 s: (85.5...92.5) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 62.0...64.0 1000 s: (60.0...66.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.40

rpm : 1290...1300 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 115.0...125.0 1000 s: (112.0...128.0)

Rack travel in mm : 17.60...18.00

Remarks:

APPLICATION

Wheel loader

Excavator

Note remarks

Test sheet Edition

: KHD 4,1 k : 28.09.90

Replaces

Test oil

: ISO-4113

Combination no.

: 0 400 864 082

Injection pump

Pump designation : PES4A85B410/3RS2799

EP type number

: 0 410 884 944

Governor

Governor design. : RS325/1250A0C2254L .

Governer no.

: 0 420 220 011

Customer

Customer-spec. information : KHD

Engine

: BF4L913

1st version kW

: 78.0

Rated speed

: 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., ban: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.50...2.60

: (2.45...2.65)

Rack travel in mm : 9.00...12.00

A27

Firing order : 1-3-4-2

Phasing

: 0-90-180-270

Tolerance + - °

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm: 1250

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 8.7...8.8

100 s: (8.5...9.0)

Spread

cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 400.0 Del.quantity cm3/: 1.3...1.7 100 s: (1.1...1.9)

cm3 : 0.2

Spread

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 rpm : 800

Speed

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

cm3

Del.quantity

1000

rpm : 1250 : 87.5...88.5 1000 : (85.5...90.5)

Spread

: 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 81...89

Testing:

Speed

1st rack travel in: 11.40

rpm : 1250...1300

2nd rack travel in: 4.00 Speed

rpm : 1370...1400

4th rack travel in: 1450 Speed

rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: ?

Setting point w/out bumper spring

Speed rpm : 325 Rack travel in mm: 6.0

Testing:

rpm : 100 Speed Minimum rack trave: 19.50 nqn.

Rack travel in mm : 5.90...6.10

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 12.40...12.50

2nd speed rpm: 750 Rack travel in m: 13.10...13.20 3rd speed rpm: 900

Rack travel in m: 12.80...13.00

4th speed rpm : 1000

Rack travel in m: 12.50...12.80

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rom Pressure hPa : 700

Rack travel mm : 13.10...13.20

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.60...11.70

2nd pressure hPa : 390

Rack travel in m: 12.50...12.60 3rd pressure hPa : 280 Rack travel in m: 11.90...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

: 750 Speed COU

Del.quantity cm3/: 89.0...91.0 1000 s: (86.5...93.5)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 62.5...63.5

1000 s: (60.5...65.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.40

rpm : 1250...1300 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0)

LOW IDLE

rpm : 400 Speed

Del.quantity cm3/: 13.0...17.0

1000 s: (11.0...19.0)

cm3 : 2.50Spread

1000 s: (4.50)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

**APPLICATION** 

Omnibus

Note remarks

Test sheet : KHD 4,7 c 1 : 11.10.90 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 865 023

Injection pump

Pump designation : PES5A80D410/3RS2603

: 0 410 885 008 EP type number

Governor

Governor design. : RS325/1650A0C2087L

: 0 420 220 003 Governer no.

Customer-spec. information

Customer : KHD

: F5L912 Engine

1st version kW : 62.5 : 3300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6,00x2,00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 1.90...2.00 Prestroke mm

: (1.85...2.05)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-5-4-2

: 0-72-144-216-288 Phasing

BASIC SETTING

1st speed rpm: 1490

Rack travel in mm : 9.90...10.00

Del.quantity cm3/: 5.0...5.1

100 s: (4.9...5.3)

Spread cm3 : 0.2

100 s: (0.35)

rpm : 325 2nd speed

Rack travel in mm : 8.70...8.90

Det.quantity cm3/: 1.6...2.0 100 s: (1.5...2.2) Spread cm3: 0.2

100 s: (0.3)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1490 Speed

: 50.5...51.5 Del.quantity

1000 : (49.0...53.0) cm3 : 2.0

Spread

1000 : (3.5)

RATED SPEED

1st version

Control lever

position degrees: 95...103

Testina:

1st rack travel in: 8.90

Speed rpm : 1690...1700
2nd rack travel in: 4.00
Speed rpm : 1740...1770
4th rack travel in: 1900

rpm : 0.30...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 64...72

Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm : 6.00

Testing:

Speed rpm: 100
Minimum rack trave: 10.80
Speed rpm: 325
Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.50
Speed rpm: 450...490

### BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 8.90

rpm : 1970...1700 Speed

Remarks:

APPLICATION

Generator set

Note remarks

: KHD 5,1 i Test sheet : 21.05.90 Edition : 1.2.90 Replaces Test oil : ISO-4113

Combination no. : 0 400 865 025

Injection pump

Pump designation : PES5A80D410/3RS2782

EP type number : 0 410 885 999

Governor

Governor design. : RSV325...1250A5C2239

: 0 420 232 526 Governer no.

Customer spec. information Customer : KHD

: F5L912 Engine

1st version kW : 68.0 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm

: (2.90...3.10)

Rack travel in mm : 9.00...12.00

: 1-3-5-4-2 Firing order

: 0-72-144-216-288 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm : 1235 1st speed

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 6.9...7.0

100 s: (6.8...7.2)

Spread cm3 : 0.3

100 s: (0.5)

rpm : 325.02nd speed Rack travel in mm: 7.4...7.6 Del.quantity cm3/: 0.8...1.4

100 s: (0.6...1.5)

Spread cm3 : 0.2100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1235 Speed

: 69.5...70.5 Del.quantity 1000 : (68.0...72.0)

cm3 : 3.00 Spread

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 103...111

Testina:

1st rack travel in: 10.80

Speed rpm: 1275...1285 2nd rack travel in: 4.00

rpm : 1330...1360 Speed

3rd rack travel in: 4.00

rpm : 1345...1375 Speed 4th rack travel in: 1510 Speed rpm : 0.30...1.40LOW IDLE 1 Control lever position degrees: 69...77 Setting point w/out bumper spring rpm : 325 Rack travel in mm: 5.5 Testing: rpm : 100 Speed Minimum rack trave: 19.50 Speed rpm : 325
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00 : 420...480 Speed rom TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1235 Rack travel in m: 11.80...11.90 2nd speed rpm : 750 Rack travel in m: 11.80...12.00 FUEL DELIVERY CHARACTERISTICS 1st version : 750 Speed rpm Del.quantity cm3/: 54.5...56.5 1000 s: (52.5...58.5) Speed rpm : 1000Del.quantity cm3/: 63.0...65.0 1000 s: (61.0...67.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.80 rpm : 1275...1285 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 105.0...115.0 1000 s: (102.0...118.0) LOW IDLE Speed rpm : 325 Rack travel in mm : 7.40...7.60

Del.quantity cm3/: 8.0...14.0

1000 s: (6.5...15.5)

Spread cm3 : 2.50 1000 s: (4.50) BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : KHD 5,1 i 1 : 31.8.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 865 026

Injection pump

Pump designation : PES5A85D410/3RS2782

: 0 410 885 999 EP type number

Governor

Governor design. : RSV325...900A4C2239-

Governer no. : 0 420 232 538

Customer-spec. information Customer

: F5L912F Engine

: 42.0 1st version kW : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6,00x2,00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm : (2.90...3.10)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-5-4-2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 710

Rack travel in mm : 10.40...10.50

Del.guantity cm3/ : 5.1...5.2

100 s: (4.9...5.4)

cm3 : 0.3Spread

100 s: (0.5)

2nd speed rpm : 325 Rack travel in mm : 7.40...7.60 Del.quantity cm3/: 1.0...1.6 100 s: (0.8...1.8)

cm3 : 0.25 Spread

100 s: (0.45)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 710 : 51.5...52.5 Del.quantity 1000 : (49.5...54.5)

: 3.0 cm3 Spread

1000 : (5.0)

RATED SPEED

1st version

Control lever position degrees: 95...103

Testina:

1st rack travel in: 9.40

Speed rpm : 752...757 2nd rack travel in: 4.00

rpm : 798...813 Speed

4th rack travel in: 945

rom : 0.30...1.40Speed

LOW IDLE 1 Control lever

position degrees: 76...84
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 5.50

Testing:

Speed : 100 rpm Minimum rack trave: 18.50

Speed rpm : 325 Rack travel in mm : 5.40...5.60

### STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 103.0...113.0 1000 s: (100.0...116.0)

Rack travel in mm : 19.30...19.70

### LOW IDLE

Speed rpm : 325
Rack travel in mm : 7.40...7.60
Del.quantity cm3/ : 10.0...16.0
1000 s: (8.0...18.0)
Spread cm3 : 2.5
1000 s: (4.5)

### Remarks:

# **APPLICATION**

Generator set

Note remarks

Test sheet : FOR 5,9 f 5 : 21.09.90 Edition : 27.3.87 Replaces : ISO-4113 Test oil

: 0 400 866 109 Combination no.

Injection pump

Pump designation : PES6A90D210RS2629 EP type number : 0 410 896 075

Governor

: RSV350...1300A0C2139 Governor design.

: 0 420 232 374 Governer no.

Customer-spec. information Customer : FORD/GB

: 380 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

: 1 680 750 014 Test Lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)
Rack travel in mm : 9.00...12.00 : 1- 5- 3- 6-Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 12.90...13.00

Del.guantity cm3/: 7.2...7.3

100 s: (7.0...7.5)

cm3 : 0.3Spread

100 s: (0.4)

rpm : 350.02nd speed Rack travel in mm : 6.4...6.5 Det.quantity cm3/: 0.9...1.3

100 s: (0.7...1.5) cm3 : 0.2 100 s: (0.4) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Speed Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

: 72.0...73.0 : (70.0...75.0) Del.quantity

1000

: 3.00 Spread cm3

1000 : (4.50)

RATED SPEED

1st version

Control lever

position degrees: 115...123

Testing:

1st rack travel in: 11.90

: 1365...1375 Speed rpm

2nd rack travel in: 4.00

rpm : 1480...1510 Speed

3rd rack travel in: 4.00

rpm : 1500...1530 Speed

4th rack travel in: 1670

rpm : 0.30...1.70Speed

LOW IDLE 1 Control lever

position degrees: 28...36

Setting point w/out bumper spring

rpm : 350 Speed Rack travel in mm: 6.0

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 Speed rpm : 350 Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00 : 500...560 Speed rpm

: 650 Speed rpm Maximum rack trave: 1.00

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 11.90

rpm : 1365...1375 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 76.0...90.0 1000 s: (73.0...93.0)

Rack travel in mm : 19.00...21.00

Remarks:

At start of delivery, locating pin must latch into slit in pointer.

Note remarks

: CUM 8,3 a63 Test sheet Edition : 17.09.90 : 9.7.90 Replaces

: ISO-4113 Test oil

Combination no. : 0 400 866 132

Injection bump

Pump designation: PES6A100D320/3RS2691

: 9 410 230 025 EP type number

Governor

: RSV500...1250A0C2190 Governor design.

-28R

Governer no. : 0 420 233 231

Customer-spec. information : C.D.C. Customer

: 6 CT-I 8.3ltr. Engine

: 139.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 27...29

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 11.40...11.50

Del.guantity cm3/: 10.1...10.3

100 s: (9.9...10.5)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 500.0 2nd speed Rack travel in mm : 5.5...5.7 Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1250 : 101.5...103.5 1000 : (99.5...105.5) Del.quantity

: 4.00 Spread cm3 1000 : (6.50)

RATED SPEED

1st version Control Lever

position degrees: 43...51

Testing:

1st rack travel in: 10.40 rpm : 1315...1325 Speed 2nd rack travel in: 4.00 rpm : 1365...1375 Speed 3rd rack travel in: 4.00 rpm : 1365...1395 Speed 4th rack travel in: 1450 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring rpm : 500 Rack travel in mm: 5.1 Testing: Speed rpm : 100 Minimum rack trave: 19.00 : 500 Speed rpm Rack travel in mm : 5.50...5.70 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.40 rpm : 1315...1325 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0) Rack travel in mm : 19.00...21.00 LOW IDLE rpm : 500 Speed Rack travel in mm : 5.50...5.70 Del.quantity cm3/: 13.0...17.0 1000 s: (10.5...19.5) cm3 : 6.00Spread 1000 s: (8.00) Remarks: : C.D.C. # 3915687 Star of-delivery mark 11° cam angle after start of delivery cyl. 1 Adjust stop lever to 0.5...1.0 mm

B10

before stop.

Note remarks

Test sheet : CUM 8,3 L 7 : 05.10.90 Edition : 2.5.89 Replaces

Test oil : ISO-4113

Combination no. : 0 400 866 139

Injection pump

Pump designation : PES6A100D320/3RS2763

EP type number : 0 410 806 006

Governor

: RSV400...1250A0c2190 Governor design.

-39R

: 0 420 233 245 Governer no.

Customer-spec. information Customer : CDC

Engine : 6 CT 8.3 ltr

1st version kW : 114.0 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 27...29

: 2.80...2.90 : (2.75...2.95) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 9.40...9.50

Del.guantity cm3/: 8.6...8.8

100 s: (8.4...9.0)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 400.02nd speed

Rack travel in mm: 5.4...5.6 Del.quantity cm3/: 1.9...2.3

100 s: (1.6...2.5)

cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm: 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

Del.quantity : 86.0...88.0 1000 : (84.0...90.0)

: 4.00 Spread cm3

1000 : (6,50)

RATED SPEED

1st version

Control lever

position degrees: 54...62

Testina:

1st rack travel in: 8.40

rpm : 1310...1320 Speed

2nd rack travel in: 4.00

rpm : 1350...1380 Speed

3rd rack travel in: 4.00

Speed rpm: 1355...1385 4th rack travel in: 1450

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 28...36

Setting point w/out bumper spring

rpm : 400 Speed Rack travel in mm: 5.0

Testing:

Speed : 100 rpm Minimum rack trave: 19.00 : 400 Speed man

Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version

1st speed

st speed rpm : 1250
Rack travel in m: 9.40...9.50

rpm : 750 2nd speed

Rack travel in m: 9.90...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

: 750 Speed rpm

Del.quantity cm3/: 84.5...88.5

1000 s: (82.5...90.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 8.40

rpm : 1310...1320 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 145.0...165.0

1000 s: (140.0...170.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm: 400
Rack travel in mm: 5.40...5.60
Del.quantity cm3/: 19.0...23.0

1000 s: (16.5...25.5)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: C.D.C. # 3914764

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.10...2.20 Prestroke mm : (2.05...2.25) Note remarks Rack travel in mm : 9.00...12.00 : CUM 5,9 v 2 : 21.09.90 : 1-5- 3- 6- 2- 4 Test sheet Firing order Edition Replaces : 31.7.90 : ISO-4113 Test oil : 0-60-120-180-240-300 Phasing Combination no. : 0 400 866 143 Tolerance + - ° : 0.50 (0.75) Injection pump Pump designation : PES6A95D12ORS2773 BASIC SETTING EP type number : 0 410 896 904 rpm: 1250Governor 1st speed : RSV350...1250A0C2237 Governor design. Rack travel in mm : 9.40...9.50 : 0 420 233 240 Governer no. Del.quantity cm3/: 8.6...8.8 Customer-spec. information 100 s: (8.3...9.0) Customer : CUMMINS cm3 : 0.3Engine : 6BT Spread 100 s: (0.6) 1st version kW : 118.0 Rated speed : 2500 rpm : 350.02nd speed Rack travel in mm: 6.1...6.3 TEST BENCH REQUIREMENTS Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.8) Test oil inlet temp. °C : 38...42 cm3 : 0.3Spread 100 s: (0.5) Overflow valve : 1 417 413 000 GUIDE SLEEVE POSITION Control-lever position Inlet press., bar: 1.50 Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Test nozzle holder : 1 688 901 017 assembly Governor spring pre-tension Click setting x : 3.00Opening | : 207...210 pressure, bar FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,6 Speed rpm : 1250 : 86.0...88.0 Del.quantity 1000 : 1 680 750 014 : (83.5...90.5) Test lines : 3.50 cm3 Spread 1000 : (6.00) Outside diameter x Wall thickness RATED SPEED : 6.00X2.00X600 x Length mm 1st version (A) Injection pump setting values Control lever Insp. values in parentheses position degrees: 91...99 Set equal delivery quant. per values

Testing:

Speed

1st rack travel in: 8.40

rpm : 1290...1300

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

2nd rack travel in: 4.00 Speed rpm : 1355...1385 3rd rack travel in: 4.00 Speed rpm : 1370...1400 4th rack travel in: 1530 Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm : 5.0

Testing:
Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 350
Rack travel in mm : 5.40...5.60

Rack travel in mm : 2.00 Speed rpm : 465...525

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 9.40...9.50
2nd speed rpm : 500

Rack travel in m: 9.40...9.60

FUEL DELIVERY CHARACTERISTICS

1st version Speed rpm : 500 Del.quantity cm3/ : 69.5...72.5 1000 s: (67.5...74.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.40 Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 107.0...117.0 1000 s: (104.0...120.0) Rack travel in mm : 13.30...13.70

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.10...6.30
Del.quantity cm3/ : 10.0...16.0
1000 s: (7.5...18.5)

Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

Start-of-delivery mark 11.5° cam angle after start of delivery cyl. 1

B14

Note remarks

Test sheet : KHD 6,1 u : 31.08.90 Edition : 21.5.90 Replaces : ISO-4113 Test oil

Combination no. : 0 400 866 152

Injection pump

Pump designation : PES6A85D410/3RS2783

EP type number : 0 410 886 893

Governor

Governor design. : RSV325...1250A5C2239

: 0 420 232 526 Governer no.

Customer-spec. information : KHD Customer

Engine : F6I 912F

: 82.0 1st version kW Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening 1

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm

: (2.90...3.10)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1235

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 6.9...7.0

100 s: (6.7...7.2)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0 Rack travel in mm: 8.4...8.6

Del.quantity cm3/: 0.8...1.4 100 s: (0.6...1.6)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1235 Speed

: 69.5...70.5 Del.quantity

1000 : (67.5...72.5)

: 3.00 Spread cm3

: (5.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 103...111

Testina:

1st rack travel in: 10.80 Speed rpm : 1275...1285

2nd rack travel in: 4.00

rpm : 1330...1360 Speed

3rd rack travel in: 4.00

rpm : 1345...1375 Speed 4th rack travel in: 1510 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 69...77 Setting point w/out bumper spring rpm : 325 Rack travel in mm: 5.5 Testina: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 325 Speed Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 rpm : 420...480 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1235 1st speed Rack travel in m: 11.80...11.90 2nd speed rpm : 750 Rack travel in m: 11.80...12.00 FUEL DELIVERY CHARACTERISTICS 1st version : 750 Speed rpm Del.quantity cm3/: 55.5...57.5 1000 s: (53.0...60.0) rpm : 1000 Speed Del.quantity cm3/: 64.0...66.0 1000 s: (61.5...68.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.80 Speed rpm : 1275...1285 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 105.0...115.0 1000 s: (102.0...118.0) Rack travel in mm: 19.50...21.00 LOW IDLE Speed rpm : 325 Rack travel in mm : 8.40...8.60

Spread cm3 : 2.50 1000 s: (4.50)

Remarks:

B16

Del.quantity cm3/: 8.0...14.0 1000 s: (6.0...16.0)

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.80...2.90 : (2.75...2.95) Prestroke mm Note remarks Rack travel in mm : 10.50 : CUM 8,3 p : 05.10.90 : 1-5-3-6-2-4 Test sheet Firing order Edition : 1.2.90 Replaces : ISO-4113 Test oil : 0-60-120-180-240-300 Phasing : 0 400 866 153 Combination no. Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Injection pump Pump designation : PES6A100D320/3RS2763 Time to cyl. no. : 1 : 0 410 806 006 EP type number BASIC SETTING Governor Governor design. : RSV400...950A0C2238rpm: 950 1st speed 1R : 0 420 233 255 Governer no. Rack travel in mm : 12.40...12.50 Customer-spec. information Del.quantity cm3/: 12.2...12.4 : C.D.C. Customer 100 s: (12.0...12.6) : 6CT 8.3 Engine cm3 : 0.41st version kW : 145.0 Spread Rated speed : 1900 100 s: (0.6) TEST BENCH REQUIREMENTS rpm : 400.02nd speed Rack travel in mm : 6.9...7.1 Del.quantity cm3/: 3.2...3.6 Test oil inlet temp. °C : 38...42 100 s: (3.0...3.8) cm3 : 0.6Overflow valve Spread : 1 417 413 047 100 s: (0.8) GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Test nozzle holder Degree: -3 : 1 688 901 017 Speed rpm : 800 assembly Rack travel in mm : 0.30...0.70 Opening pressure, bar : 207...210 Governor spring pre-tension Click setting x : ? Orifice plate FULL LOAD DELIV. AT FULL LOAD STOP diameter mm : 0,6 1st version : 1 680 750 014 Test lines Speed rpm : 950 Aneroid pressure h: 900 : 122.0...124.0 Outside diameter Del.quantity 1000 : (120.0...126.0) x Wall thickness cm3 : 4.00 1000 : (6.50) : 6.00x2.00x600 x Length mm Spread (A) Injection pump setting values RATED SPEED Insp. values in parentheses Set equal delivery quant. 1st version per values \_\_\_\_ Control lever

position degrees: 36...44

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Testing:

1st rack travel in: 11.40

rpm : 990...1000 Speed

2nd rack travel in: 4.00

Speed rpm : 1045...1075 3rd rack travel in: 4.00

rpm : 1055...1085 Speed

4th rack travel in: 1150

rpm : 0.30...1.40Speed

LOW IDLE 1

Control lever

position degrees: 22...30 Setting point w/out bumper spring

rpm : 400 Speed

Rack travel in mm: 6.5

Testina:

rpm : 100 Speed

Minimum rack trave: 19.00

rpm : 400 Speed Rack travel in mm : 6.90...7.10

Aneroid/Altitude

Compensator Test

1st version

Settina

: 500 Speed rom hPa : 900

Pressure

: 12.40...12.50 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.60...10.80

2nd pressure hPa : 220

Rack travel in m: 11.10...11.20

3rd pressure hPa : 340

Rack travel in m: 11.90...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 86.0...90.0

1000 s: (84.0...92.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.40

Speed rpm : 990...1000

B18

#### STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 150.0...170.0 1000 s: (145.0...175.0)

Rack travel in mm : 19.00...21.00

LOW IDIF

rpm : 400 Speed

Rack travel in mm : 6.90...7.10 Del.quantity cm3/: 32.5...36.5 1000 s: (30.5...38.5)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: C.D.C # 3917577

Adjust stop lever to 0.5...1.0 mm

before stop.

Start-of-delivery mark at 10° cam rotation angle after start of delivery,

cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: KHD 6,1 u 1 Test sheet : 31.8.90 Edition

Replaces

Test oil : ISO-4113

: 0 400 866 162 Combination no.

Injection pump

Pump designation : PES6A85D410/3RS2783

: 0 410 886 893 EP type number

Governor

: RSV325...900A4C2239-Governor design.

: 0 420 232 538 Governer no.

Customer spec. information Customer

: F5L912F Engine

1st version kW : 51.0 : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 313 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6,00X2,00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm

: (2.90...3.10)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 ((0.75)

BASIC SETTING

1st speed rpm : 710

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 5.1...5.2

100 s: (4.9...5.4)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 325 2nd speed

Rack travel in mm : 7.40...7.60 Del.quantity cm3/: 0.9...1.5 100 s: (0.7...1.7)

cm3 : 0.2 100 s: (0.4) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm : 710

: 51.5...52.5 : (49.5...54.5) Deliquantity 1000

: 3.0 Spread cm3

1000 : (5.0)

RATED SPEED

1st version Control lever

position degrees: 95...103

Testing:

1st rack travel in: 9.400 rpm : 752...757 2nd rack travel in: 4.00

rpm : 798...813 Speed

4th rack travel in: 945

: 0.30...0,70 Speed rpm

LOW IDLE 1 Control lever

position degrees: 76...84

Setting point w/out bumper spring

Speed rpm : 325 Rack travel in mm : 5.50

Testing:

Speed : 100 rpm Minimum rack trave: 19.50 : 325 Speed rpm

Rack travel in mm: 5.40...5.60 Rack travel in mm: 2.00 Speed rpm: 370...430

# STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 103.0...113.0 1000 s: (100.0...116.0) Kack travel in mm: 19.20...19.70

## LOW IDLE

Speed rpm : 325 Rack travel in mm : 7.40...7.60 Del.quantity cm3/: 9.0...15.0 1000 s: (7.0...17.0) cm3 : 2.5 1000 s: (4.5)

Spread

## Remarks:

## **APPLICATION**

Generator set

Note remarks

Test sheet : MWM 6,2 e11

Edition : 28.09.90

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 866 166

Injection pump

Pump designation : PES6A90D320/3RS2660

EP type number : 0 410 896 078

Governor

Governor design. : RSV300...1000A7C505R Governer no. : 0 420 233 188

Customer-spec. information Customer : MWM

: D226B-6 Engine

: 139.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm

: (2.90...3.10)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : (\.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00

& maximum rack tra: 21.00

Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm: 1900

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 8.5...8.6

100 s: (8.3...8.8)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 300.0 2nd speed

Rack travel in mm: 7.5...7.7

Del.quantity cm3/: 1.2...1.8

100 s: (1.0...2.0)

cm3 : 0.2 Spread

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 Speed

rpm : 800 Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 85.0...86.0 Del.quantity

1000 : (83.0...88.0) cm3 : 3.00

Spread

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 107...115

Testing:

1st rack travel in: 10.50 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1050...1080 Speed 3rd rack travel in: 4.00 Speed rpm : 1065...1095 4th rack travel in: 1220 rpm : 0.30...1.40 Speed LOW IDLE 1 Control Lever position degrees: 67...75 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 5.7 Testing: Speed : 100 rpm Minimum rack trave: 19.50 : 300 Speed rpm Rack travel in mm : 6.10...6.30 Rack travel in mm : 2.00 Speed rpm : 335...395 TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 11.50...11.60 2nd speed rpm : 500 Rack travel in m: 11.50...11.70 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.50 rpm : 1040...1050 Speed STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 130.0...140.0 1000 s: (127.0...143.0) Rack travel in mm : 19.50...21.00 Remarks:

APPLICATION

Generator set

Note remarks

: CUM 8,3 a83 Test sheet : 05.10.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 866 167

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 025

Governor

Governor design. : RSV400...1100A0C2190

-50R

: 0 420 233 276 Governer no.

Customer-spec. information Customer : C.D.(

: 6 CT 8 Engine

: 138.0 : 2200 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 101

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 10.9...11.1

100 s: (10.7...11.3)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 1.7...2.1 100 s: (1.5...2.3)

cm3 : 0.6

Spread 100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 109.5...111.5 Del.quantity

1000 : (107.5...113.5)

: 4.00 Spread cm3

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 48...56

Testing:

1st rack travel in: 10.40

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1215...1245 Speed

4th rack travel in: 1300 Speed rpm: 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 27...35

Setting point w/out bumper spring

rpm : 400 Speed Rack travel in mm : 5.3

Testing:

: 100 Speed man Minimum rack trave: 19.00 rpm : 400

Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 11.40...11.50

rpm : 750 2nd speed

Rack travel in m: 12.60...12.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750

Del.quantity cm3/ : 127.5...131.5

1000 s: (125.5...133.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 140.0...160.0

1000 s: (135.0...165.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

rpm : 400 Speed

Rack travel in mm : 5.70...5.90 Del.quantity cm3/: 17.0...21.0 1000 s: (15.0...23.0)

cm3 : 6.00 Spread

1000 s: (8.00)

Remarks:

: C.D.C. # 3919497

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Note remarks

: CUM 8,3 a84 Test sheet : 05.10.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 866 168

Injection pump

Pump designation : PES6A100D320/3RS2691

: 9 410 230 025 EP type number

Governor

: RSV400...1100A0C2190 Governor design.

-52R

: 0 420 233 278 Governer no.

Customer spec. information : C.D.C. Customer

: 6 CTA 8.3ltr Engine

: 174.5 : 2200 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 101

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 : (2.75...2.95) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 12.7...12.9

100 s: (12.5...13.1)

Spread cm3 : 0.4

100 s: (0.6)

rpm : 400.02nd speed Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 1.7...2.1

100 s: (1.5...2.3)

cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 127.0...129.0 Del.quantity 1000 : (125.0...131.0)

: 4.00 cm3

Spread

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing:

1st rack travel in: 11.70 Speed rpm : 1140...1150

2nd rack travel in: 4.00

rpm : 1200...1230 Speed

3rd rack travel in: 4.00

Speed rpm : 1205...1235 4th rack travel in: 1300

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 20...28

Setting point w/out bumper spring

rpm : 400 Rack travel in mm: 5.1

Testing:

: 100 Speed rom Minimum rack trave: 19.00 : 400 Speed rpm

Rack travel in mm : 5.50...5.70

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 11.70

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 155.0...175.0 1000 s: (150.0...180.0)

Rack travel in mm : 16.20...16.40

#### LOW IDLE

rpm : 400 Speed

Rack travel in mm : 5.50...5.70 Del.quantity cm3/: 17.0...21.0 1000 s: (15.0...23.0)

cm3 : 6.00

Spread 1000 s: (8.00)

Remarks:

: C.D.C. # 3917456

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Note remarks

: LIE 5,6 a 9 : 31.07.90 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 874 238 C

Injection pump

Pump designation : PES4A95D410RS2685

: 0 410 894 996 EP type number

Governor

: RSV400...1000A1C2187 Governor design.

: 0 420 232 387 Governer no.

Customer spec. information Customer : LIEBHERR

: D904 T Engine

: 100.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80 : (2.65...2.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

rpm: 10001st speed

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 13.7...13.9

100 s: (13.5...14.1)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 400.0Rack travel in mm: 6.3...6.5

Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 137.0...139.0 Del.quantity 1000 : (135.0...141.0)

: 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Testing: 1st rack travel in: 13.20 Speed rpm : 1040...1050 2nd rack travel in: 4.00 Speed rpm: 1055...1085 3rd rack travel in: 4.00 Speed rpm : 1080...1110 4th rack travel in: 1245 rpm : 0.30...1.40Speed LOW IDLE 1 Control Lever position degrees: 63...71 Setting point w/out bumper spring rpm : 400 Speed Rack travel in mm: 5.9 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 400 Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 rpm : 510...570 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.20...14.30 2nd speed rpm : 500 Rack travel in m: 14.20...14.40 FUEL DELIVERY CHARACTERISTICS 1st version : 500 Speed rpm Del.quantity cm3/: 129.5...132.5 1000 s: (127.0...135.0) Speed rpm : 750 Del.quantity cm3/: 134.0...137.0 1000 s: (131.5...139.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.20 rpm : 1040...1050 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400

Rack travel in mm : 6.50...6.70 Del.quantity cm3/: 10.0...16.0 1000 s: (7.5...18.5) Spread cm3: 3.50 1000 s: (5.50)

Remarks:

**B28** 

Note remarks

: LIE 5,6 a10 : 24.07.90 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 874 238 K

Injection pump

Pump designation : PES4A95D410RS2685

: 0 410 894 996 EP type number

Governor

Governor design. : RSV400...1000A1C2187

: 0 420 232 387 Governer no.

Customer-spec. information : LIEBHERR Customer

: D904 TB Engine

: 74.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

rpm: 980 1st speed

Rack travel in mm : 10.20...10.30

Del.quantity cm3/: 9.1...9.3

100 s: (8.9...9.5)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm: 6.3...6.5

Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 137.0...139.0 Del.quantity 1000 : (135.0...141.0) cm3 : 3.50

Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 91...99

Testing: 1st rack travel in: 9.20 Speed rpm : 1020...1040 2nd rack travel in: 4.00 rpm : 1030...1060 Speed 3rd rack travel in: 4.00 rpm : 1060...1090 Speed 4th rack travel in: 1220 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 65...73 Setting point w/out bumper spring rpm : 400 Speed Rack travel in mm: 5.9 Testina: rpm : 100Speed Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm: 2.00 rpm : 520...580 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 980 1st speed Rack travel in m: 10.20...10.30 2nd speed rpm : 500 Rack travel in m: 10.50...10.60 3rd speed rpm : 720 Rack travel in m: 10.30...10.50 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/: 82.5...85.5 1000 s: (80.0...88.0) : 700 Speed rpm Del.quantity cm3/: 91.0...94.0 1000 s: (88.5...96.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.20 rpm : 1020...1040 Speed STARTING FUEL DELIVERY rpm : 100 Speed

Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 19.50...21.00

LOW IDLE

Remarks:

c02

Note remarks

Test sheet : LIE 5,6 a11 : 31.07.90 Edition

Replaces

Test oil : ISO-4113

: 0 400 874 238L Combination no.

Injection pump

Pump designation : PES4A95D41DRS2685 : 0 410 894 996 EP type number

Governor

: RSV400...1000A1c2187 Governor design.

: 0 420 232 387 Governer no.

Customer-spec. information : LIEBHERR Customer

: D904 T Engine

: 100.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

: 0-90-180-270 Phasing

: 0.50 (0.75) Tolerance + - °

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 13.7...13.9

100 s: (13.5...14.1)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.02nd speed

Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 137.0...139.0 Del.quantity 1000 : (135.0...141.0)

: 3.50 cm3

Spread 1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Testina: 1st rack travel in: 13.20 Speed rpm : 1040...1050 2nd rack travel in: 4.00 Speed rpm : 1055...1085 3rd rack travel in: 4.00 Speed rpm : 1080...1110 4th rack travel in: 1245 Speed rpm : 0.30...1.40LOW IDLE 1 Control Lever position degrees: 63...71 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.9 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 : 510...570 Speed rpm TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.20...14.30 2nd speed rpm : 500 Rack travel in m: 14.20...14.40 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/ : 129.5...132.5 1000 s: (127.0...135.0) rpm : 750 Del.quantity cm3/: 134.0...137.0 1000 s: (131.5...139.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.20 rpm : 1040...1050 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.guantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 19.50...21.00

LOW IDLE

rpm : 400 Speed Rack travel in mm : 6.50...6.70

Del.quantity cm3/: 10.0...16.0 1000 s: (7.5...18.5) Spread cm3: 3.50 1000 s: (5.50)

Remarks:

Note remarks

: LIE 5,6 a12 : 24.07.90 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 874 238N

Injection pump

Pump designation : PES4A95D410RS2685 : 0 410 894 996 EP type number

Governor

Governor design. : RSV400...1000A1c2187

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: D904 TB Engine

: 74.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening 1

: 172...175 pressure, bar

: 1 680 750 008 Test Lines

Outside diameter x Wall thickness

: 6.GOX2.DOX600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm : (2.65...2.85)

Rack travel in mm : 9.00...12.00 Firing order : 1- 3- 4- 2

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

rpm: 980 1st speed

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 9.8...10.0

100 s: (9.6...10.2)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm: 6.3...6.5

Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980

: 98.5...100.5 Del.quantity 1000 : (96.5...102.5)

: 3.50 Spread cm3

: (6.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 91...99

Testina: 1st rack travel in: 10.10 rpm : 1020...1041 Speed 2nd rack travel in: 4.00 rpm : 1035...1065 Speed 3rd rack travel in: 4.00 Speed rpm : 1055...1085 4th rack travel in: 1220 rpm : 0.30...1.40 Speed LOW IDLE 1 Control Lever position degrees: 63...71 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.9 Testing: : 100 Speed rpm Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm: 2.00 rpm : 520...580 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 980 Rack travel in m: 11.10...11.20 2nd speed rpm : 500 Rack travel in m: 11.70...11.80 3rd speed rpm : 760 Rack travel in m: 11.30...11.50 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/: 93.0...96.0 1000 s: (90.5...98.5) rpm : 700 Del.quantity cm3/: 101.5...104.5 1000 s: (99.0...107.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.10 rpm : 1020...1041 STARTING FUEL DELIVERY

Rack travel in mm : 19.50...21.00 LOW IDLE

Speed rpm : 400 Rack travel in mm : 6.50...6.70 Del.quantity cm3/: 10.0...16.0

1000 s: (7.5...18.5) cm3 : 3.50

Spread 1000 s: (5.50)

Remarks:

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0

1000 s: (117.0...133.0)

006

Note remarks

Test sheet : LIE 5,6 a13 Edition : 24.07.90

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 874 238N

Injection pump

Pump designation : PES4A95D41DRS2685

: 0 410 894 996 EP type number

Governor

: RSV400...1000A1c2187 Governor design.

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: D904 T Engine

: 94.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 008 Test Lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

: 0-90-180-270 Phasina

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 980

R ' travel in mm : 13.00...13.10

Del.quantity cm3/: 12.7...12.9

100 s: (12.5...13.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm: 400.0 Rack travel in mm: 6.3...6.5

Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 2.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 980 Speed

: 127.0...129.0 Del.guantity 1000 : (125.0...131.0)

: 3.50 cm3 Spread 1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Testina: 1st rack travel in: 12.00 rpm : 1020...1040 Speed 2nd rack travel in: 4.00 rpm : 1035...1065 Speed 3rd rack travel in: 4.00 rpm : 1060...1090 Speed 4th rack travel in: 1220 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 63...71 Setting point w/out bumper spring rpm : 400° Rack travel in mm: 5.9 Testing: Speed : 100 rpm Minimum rack trave: 19.50 : 400 rom Rack travel in mm : 6.30...6.50 Rack travel in mm: 2.00 rpm : 510...570 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 980 1st speed Rack travel in m: 13.00...13.10 rpm : 500 2nd speed Rack travel in m: 13.40...13.50 3rd speed rpm : 825 Rack travel in m: 13.20...13.40 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 750 Speed Del.quantity cm3/: 132.5...135.5 1000 s: (130.0...138.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.10 rpm : 1020...1040 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 19.50...21.00

Speed rpm : 400
Rack travel in mm : 6.50...6.70
Del.quantity cm3/: 10.0...16.0
1000 s: (7.5...18.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

800

LOW IDLE

Note remarks

: LIE 8,4 a 4 : 07.02.89 Test sheet Edition

Replaces : ISO-4113 Test oil

Combination no. : 0 400 876 3220

Injection bump

Pump designation : PES6A95D410RS2689

: 0 410 896 916 EP type number

Governor

Governor design. : RSV400...1000A1C2187

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: D906 T Engine

1st version kW : 150.0 : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

: 1-5- 3- 6- 2- 4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference ° CS : 4.00...5.00

BASIC SETTING

rpm : 10001st speed

Rack travel in mm : 13.10...13.20

Del.quantity cm3/: 12.7...12.9

100 s: (12.5...13.1)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.3...6.5 Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 127.0...129.0 Del.quantity

1000 : (125.0...131.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Testina: 1st rack travel in: 12.10 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1050...1080 Speed 3rd rack travel in: 4.00 Speed rpm : 1080...1110 4th rack travel in: 1245 rpm : 0.30...1.40Speed LOW TDLE 1 Control lever position degrees: 63...71 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.9 Testing: : 100 Speed rpm Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 : 515...575 Speed rpm TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.10...13.20 2nd speed rpm : 500 Rack travel in m: 13.10...13.30 FUEL DELIVERY CHARACTERISTICS 1st version : 500 Speed rpm Del.quantity cm3/: 119.5...122.5 1000 s: (117.0...125.0) Speed rpm : 800 Del.quantity cm3/: 125.5...128.5 1000 s: (123.0...131.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.40 rpm : 1040...1050 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0)

Rack travel in mm: 19.50...21.00

LOW IDLE

rpm : 400 Speed

Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 10.0...16.0 1000 s: (7.5...18.5) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

c10

Note remarks

Test sheet : LIE 8,4 a 5 : 07.02.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 876 3220

Injection pump

Pump designation : PES6A95D410RS2689

EP type number : 0 410 896 916

Governor

: RSV400...1000A1c2187 Governor design.

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: D906 TB Engine

: 120.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80 : (2.65...2.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.30...11.50

Del.quantity cm3/: 10.2...10.4

100 s: (10.0...10.6)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.0 2nd speed

Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980

Del.quantity : 102.0...104.0 1000 : (100.0...106.0)

: 3.50 Spread cm3

: (6.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 89...97

Testina: 1st rack travel in: 10.30 Speed rpm: 1040...1050 2nd rack travel in: 4.00 Speed rpm : 1030...1060 3rd rack travel in: 4.00 rpm : 1055...1085 Speed 4th rack travel in: 1220 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 63...71 Setting point w/out bumper spring rpm : 400 Speed Rack travel in mm: 5.9 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 rpm : 510...570 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 980 Rack travel in m: 11.30...11.40 2nd speed rpm : 500 Rack travel in m: 11.30...11.50 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 800 Del.quantity cm3/ : 105.5...108.5 1000 s: (103.0...111.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.40 rpm : 1040...1050 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 19.50...21.00 LOW IDLE

rpm : 400

Rack travel in mm : 6.30...6.50 Del.quantity cm3/ : 10.0...16.0 1000 s: (7.5...18.5) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

C12

Speed

Note remarks

Test sheet : DEE 7,6 w 1 : 17.09.90 Edition : 28.9.89 Replaces

: ISO-4113 Test oil

Combination no. : 0 400 876 350

Injection pump

Pump designation : PES6A100D410RS2754 : 0 410 806 002 EP type number

Governor

Governor design. : RSV425...1100A2C2234

: 0 420 232 498 Governer no.

Customer-spec. information

Customer : JOHN DEERE

Engine : 6076TRW04

: 122.0 : 2200 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 101

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.95...3.05 : (2.90...3.10) Prestroke mm

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no.

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 10.60...10.70

Del.guantity cm3/: 10.0...10.2

100 s: (9.8...10.4)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 425.02nd speed

Rack travel in mm: 5.8...6.0 Del.quantity cm3/ : 2.6...3.0

100 s: (2.4...3.2)

cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 100.5...102.5 Del.quantity 1000 : (98.5...104.5)

: 4.00

Spread cm3

: (6.50) 1000

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing:

1st rack travel in: 9.60

rpm : 1145...1155 Speed

2nd rack travel in: 4.00

rpm : 1200...1210 Speed

4th rack travel in: 1300

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 17...25

Setting point w/out bumper spring

rom : 425 Rack travel in mm: 5.4

Testina:

Speed rpm : 100 Minimum rack trave: 19.00 : 425 Speed rpm

Rack travel in mm : 5.80...6.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 10.60...10.70 and speed rpm : 700

2nd speed

Rack travel in m: 11.80...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700 Del.quantity cm3/ : 125.0...128.0

1000 s: (122.5...130.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.60

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 1000 s: (95.0...125.0)

LOW IDLE

rpm : 425 Speed

Rack travel in mm : 5.80...6.00 Del.quantity cm3/ : 26.0...30.0

1000 s: (24.0...32.0)

cm3 : 6.00 Spread

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE29182

Start-of-delivery mark = 13,5° after start of delivery cyl. 1.

Starting/full-load transition speed from holding magnet = 450 1/min.

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Note remarks

: DEE 7,6 w 2 : 17.09.90 : 2.5.89 Test sheet Edition Replaces

Test oil : ISO-4113

Combination no. : 0 400 876 351

Injection pump

Pump designation : PES6A100D410RS2754

: 0 410 806 002 EP type number

Governor

: RSV425...1100A2C2234 Governor design.

-1L

: 0 420 232 499 Governer no.

Customer-spec. information

: JOHN DEERE Customer

: 6076 TRW01 Engine

: 106.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.95...3.05 : (2.90...3.10) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 9.70...9.80

Del.quantity cm3/: 8.9...9.1

100 s: (8.7...9.3)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 425.02nd speed

Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 2.6...3.0 100 s: (2.4...3.2)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 89.0...91.0 Del.quantity 1000 : (87.0...93.0)

: 4.00 Spread cm3

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 8.70

rpm : 1145...1155 Speed

2nd rack travel in: 4.00

rpm : 1200...1210 Speed

4th rack travel in: 1300

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 16...24

Setting point w/out bumper spring

rpm Rack travel in mm : 5.5

Testina:

: 100 Speed rpm Minimum rack trave: 19.00 rpm : 425

Rack travel in mm : 5.90...6.10

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 9.70...9.80

2nd speed rpm : 700

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700

Del.quantity cm3/: 110.5...113.5 1000 s: (108.0...116.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.70

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 100.0...120.0 1000 s: (95.0...125.0)

LOW IDLE

rpm : 425 Speed

Rack travel in mm : 5.90...6.10 Del.quantity cm3/ : 26.0...30.0 1000 s: (24.0...32.0)

cm3 : 6.00 1000 s: (8.00) Spread

Remarks:

: JOHN DEERE # RE29303

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control

spring retainer.

Start-of-delivery mark = 13,5° after start of delivery cyl. 1.

Note remarks

: DEE 7,6 w 4 : 17.09.90 : 2.5.89 Test sheet Edition

Replaces Test oil : ISO-4113

Combination no. : 0 400 876 354

Injection pump

Pump designation : PES6A100D410RS2754

: 0 410 806 002 EP type number

Governor

: RSV425...1100A2C2235 Governor design.

: 0 420 232 511 Governer no.

Customer-spec. information

Customer : JOHN DEERE

Engine : 6076TRW06

: 98.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.95...3.05 Prestroke mm : (2.90...3.10)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm : 1100 1st speed

Rack travel in mm : 9.00...9.10

Del.quantity cm3/: 8.3...8.5

100 s: (8.1...8.7)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 425.02nd speed

Rack travel in mm : 5.7...5.9 Del.quantity cm3/: 2.6...3.0

100 s: (2.4...3.2)

cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 83.5...85.5 1000 : (81.5...87.5) Del.quantity

: 4.00 cm3 Spread

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing:

1st rack travel in: 8.00

Speed rpm : 1145...1155 2nd rack travel in: 4.00

Speed rpm: 1200...1210 4th rack travel in: 1300 Speed

rpm : 0.30...1.40Speed

LOW TDLE 1 Control lever

position degrees: 18...26

Setting point w/out bumper spring

rpm : 425 Rack travel in mm: 5.3

Testing:

: 100 Speed rpm Minimum rack trave: 19.00 rpm : 425

Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version

1st speed

st speed rpm : 1100
Rack travel in m: 9.00...9.10

rpm : 650 2nd speed

Rack travel in m: 9.50...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 650 Speed

Del.quantity cm3/: 103.0...106.0 1000 s: (100.5...108.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.00

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 1000 s: (95.0...125.0)

LOW IDLE

rpm : 425 Speed

Rack travel in mm: 5.70...5.90 Del.quantity cm3/: 26.0...30.0 1000 s: (24.0...32.0)

cm3 : 6.00Spread

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE36069

Start-of-delivery mark = 13,5° after

start of delivery cyl. 1.

Starting/full-load transition speed from holding magnet = 450 1/min.

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Note remarks

Test sheet : DEE 7,7 d 2
Edition : 17.09.90
Replaces : 6.3.90
Test oil : ISO-4113

Combination no. : 0 400 876 360

Injection pump

Pump designation : PES6A100D410RS2762 EP type number : 0 410 806 003

Governor

Governor design. : RSV425...1100A2C2225

L

Governer no. : 9 420 234 176

Customer—spec. information Customer : JOHN DEERE

Engine : 6076ARW-06

1st version kW : 146.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 101

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 27...29 Prestroke mm : 2.95...3.05 : (2.90...3.10)

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 11.4...11.6

100 s: (11.2...11.8)

Spread cm3: 0.4

100 s: (0.6)

2nd speed rpm : 425.0 Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 2.6...3.0

100 s: (2.4...3.2)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

Speed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1100 Aneroid pressure h: 900

Del.quantity : 114.0...116.0 1000 : (112.0...118.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version Control lever

position degrees: 40...48

Testing:

1st rack travel in: 10.80

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm : 1205...1215 4th rack travel in: 1300

Speed rom : 0.30...1.40

LOW IDLE 1

Control Lever position degrees: 17...25

Setting point w/out bumper spring

rpm : 425

Rack travel in mm: 5.3

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 rpm : 425 Speed

Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 11.80...11.90

2nd speed rpm : 650

Rack travel in m: 13.70...13.90

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 900 Pressure

Rack travel mm : 13.70...13.90

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 535

Rack travel in m: 12.30...12.40

3rd pressure hPa : 720

Rack travel in m: 13.30...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

: 650 Speed rpm

Del.quantity cm3/: 147.5...150.5

1000 s: (145.0...153.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 129.0...133.0

1000 s: (126.0...136.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.80

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 100.0...120.0 1000 s: (95.0...125.0)

LOW IDLE

rpm : 425 Speed

Rack travel in mm : 5.70...5.90 Del.quantity cm3/: 26.0...30.0 1000 s: (24.0...32.0)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE29298

Start-of-delivery mark = 13.5° after start of delivery cyl. 1.

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

The stop position of the control rod must be easily reached with the stop Lever

Note remarks

Test sheet : DEE 7,7 e 1 Edition : 17.09.90

Replaces : 8.8.90 Test oil : ISO-4113

Combination no. : 0 400 876 372

Injection pump

Pump designation : PES6A1000410RS2764-1

EP type number : 0 410 806 007

Governor

Governor design. : RSV600...1100A2C2161

-7L

Governer no. : 0 420 232 540

Customer-spec. information

Customer : JOHN DEERE

Engine : 6466AZ003

1st version kW : 164.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 190...200

Test nozzle holder

assembly : 1 688 901 101

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.45...2.55

: (2.40...2.60)

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 13.10...13.20

Del.quantity cm3/: 12.6...12.8

100 s: (12.4...13.0)

Spread cm3: 0.4

100 s: (0.6)

2nd speed rpm : 600.0 Rack travel in mm : 6.0...6.2

Del.quantity cm3/: 1.7...2.1

100 s: (1.5...2.3) Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION
Control-lever position

Control-lever position Degree: -3

Speed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1100 Aneroid pressure h: 900

Del. quantity : 126.5...128.5

1000 : (124.5...130.5)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

Control Lever

position degrees: 37...45

Testing:

1st rack travel in: 12.10

rpm : 1145...1155 Speed

2nd rack travel in: 4.00

rpm : 1195...1205 Speed

3rd rack travel in: 4.00

rpm : 1215...1245 Speed

4th rack travel in: 1350

rpm : 0.30...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 19...27

Setting point w/out bumper spring

Speed rpm : 600 Rack travel in mm: 5.6

Testing:

rpm : 100 Speed

Minimum rack trave: 19.00

rpm : 600 Speed

Rack travel in mm : 6.00...6.20

Aneroid/Altitude

Compensator Test

1st version

Setting

: 500 Speed rom

hPa : -Pressure

: 9.30...9.50 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 175 Rack travel in m: 10.30...10.40

2nd pressure hPa : 280

Rack travel in m: 12.10...12.50

3rd pressure hPa : 900

Rack travel in m: 13.10...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 68.0...72.0

1000 s: (66.0...74.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quartity cm3/: 180.0...200.0 1000 s: (175.0...205.0)

LOW IDLE

rpm : 600 Speed

Rack travel in mm : 6.00...6.20 Del.quantity cm3/: 17.0...21.0 1000 s: (15.0...23.0)

cm3 : 6.00Spread

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE44661

Start-of-delivery mark at control-rod travel 10.5 mm and 15° after start of

delivery.

The stop position of the control rod must be easily reached with the stop lever

Note remarks

: DEE 7,7 e 2 : 17.09.90 Test sheet Edition

: 9.7.90 Replaces Test oil : ISO-4113

Combination no. : 0 400 876 373

Injection pump

Pump designation : PES6A100D410RS2764-1

: 0 410 806 007 EP type number

Governor

Governor design. : RSV600...1100A2C2161

-8L

: 0 420 232 541 Governer no.

Customer-spec. information

: JOHN DEERE Customer

: 6466AZ004 Engine

1st version kW : 150.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 190...200

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.45...2.55 : (2.40...2.60) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 11.7...11.9

100 s: (11.5...12.1)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 600.02nd speed Rack travel in mm: 6.3...6.5

Del.guantity cm3/: 1.9...2.3

100 s: (1.7...2.5) cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Aneroid pressure h: 900

Del.quantity : 717.3...121.5)

: 4.00 cm3 Spread

1000 : (6.50)

RATED SPEED

Control Lever position degrees: 41...49 Testina: 1st rack travel in: 11.40 rpm : 1155...1165 Speed 2nd rack travel in: 4.00 rpm : 1220...1230 Speed 3rd rack travel in: 4.00 rpm : 1220...1250 Speed 4th rack travel in: 1300 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 22...30 Setting point w/out bumper spring : 600 rom Rack travel in mm: 5.9 Testina: rpm : 100 Speed Minimum rack trave: 19.00 rpm : 600 Rack travel in mm : 6.30...6.50 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 12.40...12.50 2nd speed rpm : 750 Rack travel in m: 14.00...14.20 Aneroid/Altitude Compensator Test 1st version Setting rom : 500 Speed Pressure hPa : -: 9.60...9.80 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 95 Rack travel in m: 10.60...10.70 2nd pressure hPa : 200 Rack travel in m: 12.60...13.00 3rd pressure hPa : 900 Rack travel in m: 14.00...14.20

FUEL DELIVERY CHARACTERISTICS

rpm : 750

Aneroid pressure h: 900

Del.quantity cm3/: 140.5...144.5 1000 s: (138.5...146.5) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/ : 70.5...74.5 1000 s: (68.5...76.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.40 rpm : 1155...1165 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 180.0...200.0 1000 s: (175.0...205.0) LOW IDLE Speed : 600 man cm3 : 6.00Spread 1000 s: (8.00) Remarks:

Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 19.0...23.0 1000 s: (17.0...25.0)

: JOHN DEERE # RE44662 Start-of-delivery mark = 15.5° after start of delivery cyl. 1.

The stop position of the control rod must be easily reached with the stop lever

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : DAF 6,2 q Test sheet : 17.09.90 Edition Replaces : ISO-4113 Test oil Combination no. : 0 400 876 375 Injection pump Pump designation : PES6A95D32ORS2693 : 0 410 896 914 EP type number Governor Governor design. -2R : 0 420 233 272 Governer no. Customer-spec. information Customer : DAF : NT 119 \_ngine 1st version kW : 119.0 : 2600 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 000 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Openina : 172...175 pressure, bar : 1 680 750 015 Test lines Outside diameter x Wall thickness

: RSV300...1300A0c2248 : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 2.00...2.10 : (1.95...2.15)

Rack travel in mm : 7.50...10.50 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 1 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00 Difference ° CS : 2.50...3.50 BASIC SETTING 1st speed rpm: 850 Rack travel in mm : 11.10...11.20 Del.quantity cm3/: 6.1...6.2 100 s: (5.9...6.4) cm3 : 0.3Spread 100 s: (0.6) rpm : 300.02nd speed Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 0.7...1.1 100 s: (0.4...1.3) cm3 : 0.3 Spread 100 s: (0.5) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : 5.50FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 850 : 61.5...62.5 Del.guantity 1000 : (59.5...64.5) : 3.50 Spread cm3 : (6.00) 1000 RATED SPEED

Control lever position degrees: 103...111 Testina: 1st rack travel in: 9.30 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1385...1415 Speed 3rd rack travel in: 4.00 rpm : 1410...1440 Speed 4th rack travel in: 1570 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 73...81 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.6 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 300 Rack travel in mm : 6.00...6.20 Rack travel in mm : 2.00 rpm : 560...620 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1290
Rack travel in m: 10.30...10.40
2nd speed rpm : 500
Rack travel in m: 11.60...11.70 4th speed rpm : 1025 Rack travel in m: 10.50...10.70 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 1290 Del.quantity cm3/: 68.0...70.0 1000 s: (65.5...72.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.30 Speed rpm : 1340...1350 LOW IDLE Speed rpm : 300 Rack travel in mm : 6.00...6.20 Del.quantity cm3/ : 7.0...11.0 1000 s: (4.5...13.5)

Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

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Note remarks

Test sheet : DAF 6,2 q 1 Edition : 28.09.90

Replaces

Test oil : ISO-4113

Combination no. : 0 400 876 375

Injection pump

Pump designation : PES6A95D32ORS2693 : 0 410 896 914 EP type number

Governor

Governor design. : RSV300...1300A0C2251

: 0 420 233 272 Governer no.

Customer-spec. information Customer : DAF

: NT 119 Engine

: 119.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening (

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 7.50...10.50

Firing order : 1-5- 3- 6- 2- 4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference ° CS : 2.50...3.50

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 6.1...6.2

100 s: (5.9...6.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed

Rack travel in mm : 6.0...6.2 Del.quantity cm3/: 0.7...1.1

100 s: (0.4...1.3)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

: 61.5...62.5 Del.quantity

1000 : (59.5...64.5)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

Control Lever position degrees: 103...111 Testina: 1st rack travel in: 9.30 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1385...1415 3rd rack travel in: 4.00 Speed rpm : 1410...1440 4th rack travel in: 1570 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 73...81 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.6 Testing: rpm : 100 Speed Minimum rack trave: 19.50 Speed rpm : 300 Rack travel in mm : 6.00...6.20 Rack travel in mm: 2.00 Speed rpm : 560...620TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1290 Rack travel in m: 10.30...10.40 2nd speed rpm : 500 Rack travel in m: 11.60...11.70 4th speed rpm : 950 Rack travel in m: 10.90...11.10 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1290 Speed Del.quantity cm3/: 68.0...70.0 1000 s: (65.5...72.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.30 rpm : 1340...1350Speed LOW IDLE rpm : 300 Speed Rack travel in mm : 6.00...6.20 Del.quantity cm3/ : 7.0...11.0 1000 s: (4.5...13.5)

Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

:

Note remarks

: DAF 6,2 r : 14.09.90 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 876 376

Injection pump

Pump designation : PES6A95D32ORS2796 EP type number : 0 410 896 901

Governor

: RSV300...1300A0c2248 Governor design.

-1R

: 0 420 233 273 Governer no.

Customer-spec. information Customer

: NS 156G Engine

1st version kW : 156.0 : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 7.50...10.50

: 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference ° CS : 2.50...3.50

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 8.3...8.4

100 s: (8.1...8.6)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm : 6.4...6.6

Del.quantity cm3/: 0.6...1.0

100 s: (0.3...1.2)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

: 83.5...84.5 Del.quantity 1000 : (81.5...86.5)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

position degrees: 100...108 Testing: 1st rack travel in: 11.40 rpm : 1320...1330 Speed 2nd rack travel in: 4.00 rpm : 1385...1415 Speed . 3rd rack travel in: 4.00 Speed rpm : 1405...1435 4th rack travel in: 1570 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 6.0 Testing: rpm : 100 Speed Minimum rack trave: 19.50 : 300 rpm Rack travel in mm : 6.40...6.60 Rack travel in mm: 2.00 rpm : 570...630 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1290 Rack travel in m: 12.40...12.50 2nd speed rpm : 500 Rack travel in m: 13.50...13.60 4th speed rpm : 1080 Rack travel in m: 12.90...13.10 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure Rack travel mm : 12.70...12.80 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 11.60...11.80 2nd pressure hPa : 280
Rack travel in m: 12.40...12.50
3rd pressure hPa : 250 Rack travel in m: 11.90...12.10 FUEL DELIVERY CHARACTERISTICS

Control lever

1st version
Aneroid pressure h: 1000
Speed rpm : 1290
Del.quantity cm3/: 85.0...87.0
1000 s: (82.5...89.5)
Aneroid pressure h: Speed rpm : 600
Del.quantity cm3/: 57.5...58.5
1000 s: (55.5...60.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.40
Speed rpm : 1320...1330

LOW IDLE

Remarks:

002

Note remarks

: DAF 6,2 q 2 Test sheet : 17.09.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 876 377

Injection pump

Pump designation : PES6A95D32DRS2693Z

: 0 410 896 913 EP type number

Governor

: RSV300...1300A0c2248 Governor design.

-1R

: 0 420 233 273 Governer no.

Customer-spec. information Customer : DAF

: NS156 Engine

1st version kW : 156.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 7.50...10.50 Firing order : 1-5- 3- 6- 2- 4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference ° CS : 2.50...3.50

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 8.5...8.6

100 s: (8.3...8.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm : 6.0...6.2

Del.quantity cm3/: 0.7...1.1

100 s: (0.4...1.3)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000Speed Aneroid pressure h: 700

: 85.5...86.5 Del.quantity

1000 : (83.5...88.5)

Spread cm3

: 3.50 : (6.00) 1000

RATED SPEED

Testing: 1st rack travel in: 10.90 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1395...1425 Speed 3rd rack travel in: 4.00 Speed rpm : 1430...1460 4th rack travel in: 1590 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper soring rpm : 300 Rack travel in mm: 5.6 Testing: rpm : 100 Speed Minimum rack trave: 19.50 : 300 rom Rack travel in mm : 6.00...6.20 Rack travel in mm : 2.00 rpm : 550...610 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 12.40...12.50 rom : 500 2nd speed Rack travel in m: 12.40...12.50 3rd speed rpm : 1300 Rack travel in m: 11.80...12.00 Aneroid/Altitude Compensator Test 1st version Settina : 600 Speed rpm h₽a : 700 Pressure : 11.90...12.00 Rack travel mm Measurement 1/min : 600 Speed 1st pressure hPa : -Rack travel in m: 10.30...10.50 2nd pressure hPa : 290 Rack travel in m: 11.50...11.60 3rd pressure hPa : 250 Rack travel in m: 10.70...10.90 FUEL DELIVERY CHARACTERISTICS

Control lever

position degrees: 101...109

1st version Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/ : 53.5...54.5 1000 s: (51.5...56.5) BREAKAWAY 1st version 1mm rack travel less than

full load rack tr: 10.90 rpm : 1340...1350 Speed

rpm : 300 Speed Rack travel in mm : 6.00...6.20 Del.quantity cm3/ : 7.0...11.0 1000 s: (4.5...13.5) cm3 : 3.50

Spread 1000 s: (5.50)

Remarks:

LOW IDLE

Note remarks

Test sheet : DAF 6,2 q 3 : 14.09.90 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 876 378

Injection pump

: PES6A95D32ORS2693 Pump designation : 0 410 896 914 EP type number

Governor

: RSV300...1300A0c2248 Governor design.

–2R

: 0 420 233 274 Governer no.

Customer—spec. information Customer : DAF

: NT 133 Engine

1st version kW : 133.0 : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina |

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.00...2.10 : (1.95...2.15) Prestroke mm

Rack travel in mm : 7.50...10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00

Difference ° CS : 2.50...3.50

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 7.1...7.2

100 s: (6.9...7.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed

Rack travel in mm : 6.0...6.2 Del.quantity cm3/: 0.7...1.1 100 s: (0.4...1.3)

cm3 : 0.3

Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed Aneroid pressure h: 700

Del.quantity : (1.3...2.)
1000 : (69.5...74.5)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

Control lever position degrees: 103...111 Testing: 1st rack travel in: 9.50 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1390...1420 Speed 3rd rack travel in: 4.00 rpm : 1410...1440 Speed 4th rack travel in: 1570 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 73...81 Setting point w/out bumper spring Speed rpm Rack travel in mm: 5.6 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 300 Speed Rack travel in mm : 6.00...6.20 Rack travel in mm: 2.00 rpm : 560...620 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1290 Rack travel in m: 10.50...10.60 2nd speed rpm : 500 Rack travel in m: 11.50...11.60 4th speed rpm : 1045 Rack travel in m: 10.90...11.10 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm Pressure hPa : 700 Rack travel mm : 11.20...11.30 Measurement Speed  $1/\min : 600$ 1st pressure hPa : -Rack travel in m: 10.10...10.30 2nd pressure hPa : 250 Rack travel in m: 10.70...10.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700

rpm : 1290 Speed Del.quantity cm3/: 73.0...75.0 1000 s: (70.5...77.5) Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/: 50.5...51.5 1000 s: (48.5...53.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.50 rpm : 1340...1350 Speed LOW IDLE : 300 Speed rpm

Spread cm3 : 3.50 1000 s: (5.50)

Rack travel in mm : 6.00...6.20

Del.quantity cm3/ : 7.0...11.0

1000 s: (4.5...13.5)

Remarks:

006

: 1-5-3-6-2-4 Firing order BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : PEN 7,0 k 1 : 14.09.90 : 0-60-120-180-240-300 Phasing Test sheet Edition : 12.9.86 Tolerance + - ° : 0.50 (0.75) Replaces : ISO-4113 Test oil Time to cyl. no. : 1 Combination no. : 0 401 846 455 BASIC SETTING Injection pump rpm: 900 Pump designation : PE6P110A320RS367Y 1st speed : 0 411 816 132 EP type number Rack travel in mm : 9.70...9.80 Governor Governor design. : RQV250...1000PA394 : 0 421 813 241 Del.guantity cm3/: 8.5...8.7 Governer no. 100 s: (8.2...9.0) Customer-spec. information : VOLVO-PENTA Customer cm3 : 0.4Spread : TMD 70 C Engine 100 s: (0.8) 1st version kW : 154.5 rpm : 250.0Rated speed : 2000 2nd speed Rack travel in mm : 4.9...5.1 Del.quantity cm3/: 1.6...2.0 TEST BENCH REQUIREMENTS 100 s: (1.3...2.2) cm3 : 0.3Test oil Spread inlet temp. °C : 38...42 100 s: (0.6) GUIDE SLEEVE POSITION Overflow valve : 1 417 413 025 Control-lever position Degree: -1 rpm : 1050 Inlet press., bar: 1.50 Speed Rack travel in mm : 15.20...17.80 Test nozzle holder FULL LOAD DELIV. AT FULL LOAD STOP : 0 681 343 009 assembly Openina 1st version pressure, bar : 172...175 Speed rpm : 900 Aneroid pressure h: 700 Del.quantity : 85.0...90.0) Test lines : 1 680 750 004 : 4.00 Spread cm3 1000 : (8.00) Outside diameter x Wall thickness : 6.00x1.50x600 RATED SPEED x Length mm 1st version (A) Injection pump setting values Insp. values in parentheses Control lever Set equal delivery quant. position degrees: 61...69 per values Testing: 1st rack travel in: 8.70 BEGINNING OF DELIVERY rpm : 1050...1060 Test pressure, bar: 25...27 Speed 2nd rack travel in: 4.00 Speed rpm : 1110...1140 4th rack travel in: 1250 : 3.00...3.10 : (2.95...3.15) Prestroke mm

rpm : 0.00...1.00

Speed

Rack travel in mm : 9.00...12.00

LOW IDLE 1 Control lever position degrees: 8...16 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 4.8 Testing: Speed rpm : 100 Minimum rack trave: 6.50 rpm : 250 Speed Rack travel in mm : 4.70...4.90
Rack travel in mm : 2.00
Speed rpm : 350...410 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.70 rpm : 1050...1060 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 165.0...200.0 1000 s: (161.0...204.0) LOW IDLE Speed rpm: 250 Rack travel in mm: 4.90...5.10 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) Spread cm3 : 3.00 1000 s: (6.00) Remarks: Delivery-valve spring pre-tension = 2.40...2.60 mm. Permissible alteration from 2.20...2.90 mm APPLICATION Navy

: 1-5-3-6-2-4 Firing order BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : DAF 11,6 x2 Phasing : 0-60-120-180-240-300 Test sheet Edition : 08.06.90 Tolerance + - ° : 0.50 (0.75) : 16.2.90 Replaces : ISO-4113 Test oil BASIC SETTING Combination no. : 0 401 846 540 rpm: 600 1st speed Injection pump Rack travel in mm : 12.80...12.90 Pump designation : PE6P110A320RS407-1 EP type number : D 411 816 147 Del.quantity cm3/: 15.3...15.5 Governor Governor design. : RQ275/1000PA861 : 0 421 80 397 100 s: (15.0...15.7) Governer no. Customer-spec. information Spread cm3 : 0.4: DAF Customer 100 s: (0.7) : LT 195 Engine 2nd speed rpm : 275.0 Rack travel in mm : 7.2...7.4 1st version kW : 195.0 Del.quantity cm3/: 1.4...1.9 Rated speed : 2000 100 s: (1.1...2.1) cm3 : 0.4 100 s: (0.7) TEST BENCH REQUIREMENTS Spread Test oil inlet temp. °C : 38...42 GUIDE SLEEVE POSITION Control-lever position Degree: -1 Overflow valve rpm : 600 : 1 417 413 025 Rack travel in mm : 15.40...16.60 Inlet press., bar: 1.50 FULL LOAD DELIV. AT FULL LOAD STOP Test nozzle holder : 0 681 343 009 1st version assembly Speed rpm : 600 Aneroid pressure h: 700 Opening Del.quantity : 153.0...155.0 1000 : (150.5...157.5) : 172...175 pressure, bar cm3 : 4.00Spread : 1 680 750 015 1000 : (7.50) Test lines RATED SPEED Outside diameter x Wall thickness : 6.00x1.50x600 1st version x Length mm (A) Injection pump setting values Insp. values in parentheses Setting point: Speed rpm : 600Set equal delivery quant. Rack travel in mm: 16.0 per values Testing: 1st rack travel in: 11.40 Speed rpm: 1030...1045 2nd rack travel in: 4.00 BEGINNING OF DELIVERY Test pressure, bar: 25...27 rpm : 1100...1130 : 2.80...2.90 Prestroke mm Speed 4th rack travel in: 1300 : (2.75...2.95) rpm : 0.00...1.00

beed

Rack travel in mm : 9.00...12.00

009

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275 Rack travel in mm : 7.3

Testing:

rpm : 100 Speed Minimum rack trave: 8.40 : 275 rpm

Rack travel in mm : 7.20...7.40

Rack travel in mm : 2.50

: 340...380 Speed rom

TORQUE CONTROL

Dimension a mm : 0.25

Torque control curve - 1st version

rpm : 980 1st speed

Rack travel in m: 12.40...12.50

2nd speed rpm : 600

Rack travel in m: 13.00...13.20

3rd speed rpm : 900

Rack travel in m: 12.50...12.80

Aneroid/Altitude Compensator Test

1st version Settina

: 600 Speed rpm hPa : 700 Pressure

: 12.80...12.90 Rack travel mm

Measurement

 $1/\min : 600$ Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90 2nd pressure hPa : 340 Rack travel in m: 12.50...12.60 3rd pressure hPa : 310

Rack travel in m: 12.10...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 980 Del.quantity cm3/ : 146.5...148.5

1000 s: (142.5...152.5)

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 130.0...132.0

1000 s: (127.5...134.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.40

rpm : 1030...1045 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 220.0...260.0 1000 s: (216.0...264.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 275
Rack travel in mm : 7.20...7.40 Del.quantity cm3/: 14.0...19.0

1000 s: (11.5...21.5)

Spread cm3 : 4.50

1000 s: (7.50)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**APPLICATION** 

**Omnibus** 

Note remarks

Test sheet : DAF 11,6 x5 : 10.08.90 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 540Z

Injection pump

Pump designation : PE6P110A320RS407-1

: 0 411 816 147 EP type number

Governor

Governor design. : RQ275/1000PA861 : 0 421 80 397 Governer no.

Customer-spec. information : DAF

Customer

: LT 195 MBG Engine

: 195.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 12.80...12.90

Del.quantity cm3/: 15.3...15.5

100 s: (15.0...15.7)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 275.0 2nd speed

Rack travel in mm: 7.2...7.4

Del.quantity cm3/: 1.4...1.9 100 s: (1.1...2.1)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 600

Rack travel in mm : 15.40...16.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 700

Del.quantity : 153.0...155.0 1000 : (150.5...157.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm

Rack travel in mm: 16.0

Testing:

1st rack travel in: 11.40

rpm : 1030...1045 Speed

2nd rack travel in: 4.00

Speed rpm : 1100...1130 4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 275Rack travel in mm: 7.3

Testing:

: 100 Speed rpm Minimum rack trave: 8.40 : 275 Speed rpm

Rack travel in mm : 7.20...7.40

Rack travel in mm : 2.50

: 340...380 Speed rom

TORQUE CONTROL

Dimension a mm : 0.25

Torque control curve - 1st version

rpm : 980 1st speed

Rack travel in m: 12.40...12.50

rpm : 600 2nd speed

Rack travel in m: 13.00...13.20

3rd speed rpm : 900

Rack travel in m: 12.50...12.80

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 600 hPa : 700 Pressure

: 12.80...12.90 Rack travel mm

Measurement

 $1/\min : 600$ Speed

1st pressure hPa : -

Rack travel in m: 11.20...11.40

2nd pressure hPa : 240

Rack travel in m: 12.50...12.60 3rd pressure hPa : 190

Rack travel in m: 11.60...11.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

: 980 rpm

Del.quantity cm3/: 146.5...148.5 1000 s: (142.5...152.5)

Aneroid pressure h: -

rpm : 600Speed

Del.quantity cm3/: 115.5...117.5

1000 s: (113.0...120.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.40

rpm : 1030...1045 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 220.0...260.0 1000 s: (216.0...264.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

rpm : 275 Speed

Rack travel in mm : 7.20...7.40 Del.quantity cm3/: 14.0...19.0

1000 s: (11.5...21.5)

cm3 : 4.50 Spread

1000 s: (7.50)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting soleno: the start position must be reached.

**APPLICATION** 

**Omnibus** 

Note remarks

Test sheet : DAF 11,6 x3 : 19.06.90 Edition Replaces : 2.6.87

: ISO-4113 Test oil

: 0 401 846 541 Combination no.

Injection pump

: PE6P110A320RS407-1 Pump designation

: 0 411 816 147 EP type number

Governor

Governor design. : RQ275/1100PA864 : 0 421 80 400 Governer no.

Customer-spec. information Customer : DAF

: LT 210 Engine

: 210.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 15.5...15.7

100 s: (15.2...15.9)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 275.0 2nd speed Rack travel in mm: 7.2...7.4 Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 600 Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 700

: 155.0...157.0 Del.quantity

1000 : (152.5...159.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 15.8

Testina:

1st rack travel in: 11.50

rpm : 1135...1150 Speed

2nd rack travel in: 4.00

rpm : 1180...1210 Speed

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275 Rack travel in mm : 7.3

Testing:

rpm : 100 Speed Minimum rack trave: 8.40 Rack travel in mm: 7.20...7.40
Rack travel in mm: 2.00
Speed rnm: 2.00

TORQUE CONTROL

Dimension a mm : 0.25

Torque control curve - 1st version

1st speed rpm : 1080
Rack travel in m: 12.50...12.60
2nd speed rpm : 600

Rack travel in m: 13.10...13.30

3rd speed rpm : 850

Rack travel in m: 12.80...12.90

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm Pressure hPa : 700

: 12.90...13.00 Rack travel mm

Measurement

Speed  $1/\min : 600$ 

1st pressure hPa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 310

Rack travel in m: 12.60...12.70

3rd pressure hPa : 270

Rack travel in m: 12.10...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

: 1080 Speed rpm

Del.quantity cm3/: 148.0...150.0 1000 s: (144.0...154.0)

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 130.0...132.0 1000 s: (127.5...134.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.50

rpm : 1135...1150 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 245.0...285.0 1000 s: (241.0...289.0) Rack travel in mm: 19.50...21.00

LOW IDLE

Speed rpm : 275

Rack travel in mm : 7.20...7.40

Del.quantity cm3/: 14.0...19.0 1000 s: (11.5...21.5)

cm3 : 4.50Spread

1000 s: (7.50)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

APPLICATION

**Omnibus** 

Note remarks

Test sheet : ENA 10,1 e2 Edition : 14.09.90

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 552

Injection pump

Pump designation : PE6P100A820LS503

: 0 411 806 197 EP type number

Governor

Governor design. : RQ250/1000PA352-1

: 0 421 80 412 Governer no.

Customer-spec. information Customer : ENASA

: 95 T1 AZ Engine

: 155.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.85...2.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 980 1st speed

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 15.5...15.7

100 s: (15.3...15.9)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.8...8.0

Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 600 Speed

Rack travel in mm : 16.00...17.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 980 Speed

Aneroid pressure h: 900

: 155.0...157.0 Del.quantity 1000 : (153.0...159.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm: 16.6

Testing:

1st rack travel in: 12.70

rpm : 1045...1060 Speed

2nd rack travel in: 4.00

rpm : 1100...1130 Speed

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 6.0

Testina:

: 100 Speed rpm Minimum rack trave: 7.50 : 250 Speed rpm

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

rpm : 350...390 Speed

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

rpm : 980 1st speed

Rack travel in m: 13.70...13.80

rpm : 700 2nd speed

Rack travel in m: 14.40...14.80

3rd speed rpm : 825

Rack travel in m: 13.90...14.30

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 900 Pressure

: 14.10...14.30 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 12.90...13.30

2nd pressure hPa : 400

Rack travel in m: 14.10...14.20

3rd pressure hPa : 300

Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm : 700 Speed

Del.quantity cm3/: 159.0...163.0 1000 s: (157.0...165.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 130.0...132.0

1000 s: (127.0...135.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.70

rpm : 1045...1060 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 150.0...170.0

1000 s: (146.0...174.0)

LOW IDLE

Speed rpm

Rack travel in mm : 5.90...6.10

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order : 1-5-3-6-2-4 Note remarks : DAF 11,6 y9 : 29.06.90 Test sheet : 0-60-120-180-240-300 Phasing Edition : 2.9.88 Tolerance + - ° : (0.50 (0.75) Replaces Test oil : ISO-4113 BASIC SETTING Combination no. : 0 401 846 556 rpm: 650 1st speed Injection pump Pump designation : PE6P12OA32ORS415-1 Rack travel in mm : 11.10...11.20 EP type number : 0 411 826 123 Governor Del.quantity cm3/: 17.1...17.3 Governor design. : RQ250/1100PA417-10 : 0 421 80 445 100 s: (16.8...17.6) Governer no. Customer-spec. information cm3 : 0.5Spread Customer 100 s: (0.9) : DKV 1160 Engine rpm : 250.0 2nd speed Rack travel in mm : 6.7...6.9 TEST BENCH REQUIREMENTS Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) Test oil inlet temp. °C : 38...42 cm3 : 0.8Spread 100 s: (1.2) Overflow valve : 1 417 413 025 GUIDE SLEEVE POSITION Control-lever position Inlet press., bar: 1.50 Degree: -1 rpm : 550 Speed Rack travel in mm : 15.20...16.40 Test nozzle holder : 1 688 901 019 assembly FULL LOAD DELIV. AT FULL LOAD STOP Openina pressure, bar : 207...210 1st version Speed rpm : 650 Aneroid pressure h: 700 Orifice plate : 171.0...173.0 diameter mm : 0,8 Del.quantity 1000 : (168.0...176.0) : 5.00 Spread cm3 Test lines : 1 680 750 067 1000 : (9.00) Outside diameter RATED SPEED x Wall thickness x Length mm : 6.00x1.50x1000 1st version (A) Injection pump setting values Setting point: Insp. values in parentheses Speed rpm Rack travel in mm : 15.8 Set equal delivery quant. per values Testing: 1st rack travel in: 9.10 BEGINNING OF DELIVERY rpm : 1135...1150 Test pressure, bar: 25...27 Speed 2nd rack travel in: 4.00

rpm : 1180...1210

rpm : 0.00...1.00

Speed

Speed

4th rack travel in: 1300

Prestroke mm

: 2.80...2.90

Rack travel in mm : 9.00...12.00

: (2.75...2.95)

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250Rack travel in mm: 6.3

Testing:

Speed rpm : 100 Minimum rack trave: 7.20 : 250 Speed rpm

Rack travel in mm : 6.20...6.40

Rack travel in mm : 2.00

Speed rom : 440...480

TORQUE CONTROL

Dimension a mm : 0.68

Torque control curve - 1st version 1st speed rpm : 1090

Rack travel in m: 10.10...10.20

rpm : 650 2nd speed

Rack travel in m: 11.40...11.60

rpm : 750 3rd speed

Rack travel in m: 11.00...11.20

4th speed rpm : 825

Rack travel in m: 10.60...10.90

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm hPa : 700 Pressure

Rack travel mm : 11.10...11.20

Measurement

 $1/\min : 600$ Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 290

Rack travel in m: 10.70...10.90 3rd pressure hPa : 260

Rack travel in m: 10.20...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 rpm\_ : 1090 Speed

Del.quantity cm3/: 159.0...161.0

1000 s: (155.0...165.0)

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 129.0...131.0 1000 s: (126.0...134.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.10

rpm : 1135...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 320.0...360.0

1000 s: (320.0...360.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

: 250 Speed rpm

Rack travel in mm : 6.20...6.40

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Note remarks Test sheet : ENA 11,9 a3 : 14.09.90 : 23.3.90 Edition Replaces Test oil : ISO-4113 Phasing Combination no. : 0 401 846 563 Tolerance + - ° Injection pump Pump designation : PE6P120A320RS257 EP type number : 0 411 826 075 BASIC SETTING Governor Governor design. : RQV250...1050PA808-3 1st speed : 0 421 813 812 Governer no. Customer-spec. information : FNASA Customer : 96 T1 CX Engine : 228.0 1st version kW Spread : 2100 Rated speed TEST BENCH REQUIREMENTS 2nd speed Test oil inlet temp. °C : 38...42 Overflow valve Spread : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly 1st speed Openina travel mm pressure, bar : 207...210 2nd speed travel mm Orifice plate 3rd speed : 0,8 diameter mm travel mm 4th speed travel mm : 1 680 750 067 Test lines 5th speed travel mm Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

: 2.80...2.90 : (2.75...2.95) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 : 0.50 (0.75) Time to cyl. no. : 1 rpm: 650 Rack travel in mm : 10.40...10.50 Del.quantity cm3/: 17.9...18.1 100 s: (17.6...18.4) cm3 : 0.5100 s: (0.9) rpm : 250.0Rack travel in mm : 5.6...5.8 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) cm3 : 0.8 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 : 1.00...1.40 rpm : 350 : 1.90...2.50 rpm : 700 : 4.50...5.10 rpm : 1095 : 8.00...8.20 rpm : 1185 : 9.00...9.40 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1110 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Aneroid pressure h: 900

rpm : 650

Speed

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 1/9.0...184.0)

cm3 : 5.00Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 114...122

Testing:

1st rack travel in: 9.40

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1150...1180 Speed

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 78...86

Testina:

Speed rom Minimum rack trave: 7.20 Speed rpm

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

rpm : 250...450 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm hPa : 900 Pressure

: 10.40...10.50 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 7.60...8.00

2nd pressure hPa : 650

Rack travel in m: 10.00...10.10

3rd pressure hPa : 380

Rack travel in m: 8.40...8.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 rpm : 1030 Speed

Del.quantity cm3/: 191.0...197.0

1000 s: (188.0...200.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 104.0...106.0

1000 s: (101.0...109.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0)

Rack travel in mm : 19.50...21.00

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,

the start position must be reached.

**APPLICATION** 

**Omnibus** 

Note remarks

Test sheet : DAF 11,6 x6 : 31.08.90 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 564

Injection pump

Pump designation : PE6P110A320RS407-1

: 0 411 816 147 EP type number

Governor

Governor design. : RQ275/900PA818-2 : 0 421 80 519 Governer no.

Customer-spec. information : DAF Customer

Engine : LT 156

: 156.0 1st version kW : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 015 Test Lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 11.80...11.90

Del.guantity cm3/: 13.4...13.6

100 s: (13.1...13.8)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 275.0 2nd speed Rack travel in mm: 7.0...7.2 Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1) Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 600

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 60L

: 134.0...136.0 Del.quantity 1000 : (131.5...138.5)

Spread cm3 : 4.00 : (7.50) 1000

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm : 15.8

Testing:

1st rack travel in: 10.30 rpm : 930...945 Speed

2nd rack travel in: 4.00

rpm : 1015...1045 Speed

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1 Setting point w/out bumper spring rpm : 275 Speed Rack travel in mm: 7.1 Testing: Speed rpm : 100 Minimum rack trave: 8.30 : 275 rpm Rack travel in mm : 7.00...7.20 Rack travel in mm : 2.50 : 345...385 Speed rom TORQUE CONTROL Dimension a mm : 0.60 Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 11.30...11.40 : 600 2nd speed rpm Rack travel in m: 12.40...12.60 3rd speed rpm : 675 Rack travel in m: 12.00...12.20 4th speed rpm : 725 Rack travel in m: 11.60...11.90 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 875 Speed Del.quantity cm3/: 118.5...122.5 1000 s: (115.5...125.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.30 rpm : 930...945 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 245.0...285.0 1000 s: (241.0...289.0) Rack travel in mm : 19.50...21.00 LOW IDLE Speed rpm : 275 Rack travel in mm : 7.00...7.20 Del.quantity cm3/: 14.0...19.0 1000 s: (11.5...21.5) cm3 : 4.50 Spread 1000 s: (7.50)

D22

Remarks:

: 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order Note remarks : 0-60-120-180-240-300 Test sheet : ENA 10,1 h Phasing : 14.09.90 Edition Tolerance + - ° : 0.50 (0.75) : 30.3.90 Replaces : ISO-4113 Test oil Time to cyl. no. : 1Combination no. : 0 401 846 565 BASIC SETTING Injection pump Pump designation : PE6P110A820LS513 1st speed rpm: 600 EP type number : 0 411 816 174 Rack travel in mm : 13.10...13.20 Governor Governor design. : RQ250/1000PA352-1 : 0 421 80 412 Del.guantity cm3/: 17.9...18.1 Governer no. 100 s: (17.6...18.4) Customer-spec. information Customer : ENASA Spread cm3 : 0.4: 95 R3AZ,R1AZ Engine 100 s: (0.7) : 184.0 1st version kW rpm : 250.0Rated speed : 2000 2nd speed Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.8...2.3 100 s: (1.5...2.5) TEST BENCH REQUIREMENTS cm3 : 0.4Test oil Spread 100 s: (0.7) inlet temp. °C : 38...42 GUIDE SLEEVE POSITION Overflow valve : 1 417 413 025 Control-lever position Degree: -1 rpm : 600 Inlet press., bar: 1.50 Speed Rack travel in mm : 16.00...17.20 Test nozzle holder FULL LOAD DELIV. AT FULL LOAD STOP : 0 681 343 009 assembly 1st version Opening Speed : 172...175 rpm : 600 pressure, bar Aneroid pressure h: 900 Anerow ... Del.quantity 1000 : 179.0...181.0 : (176.0...184.0) Test lines : 1 680 750 015 : 4.00 : (7.50) Spread cm3 1000 Outside diameter x Wall thickness : 6.00x1.50x600 RATED SPEED x Length mm (A) Injection pump setting values 1st version Insp. values in parentheses Set equal delivery quant. Setting point: : 600 per values rpm Rack travel in mm : 16.6 BEGINNING OF DELIVERY Test pressure, bar: 25...27 Testing: 1st rack travel in: 11.80 rpm : 1045...1060 Prestroke mm : 3.20...3.30 Speed

2nd rack travel in: 4.00

rpm

Speed

: 1095...1125

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

4th rack travel in: 1200

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 6.0

Testing:

rpm : 100 Speed Minimum rack trave: 7.50 rpm : 250 Speed

Rack travel in mm: 5.90...6.10 Rack travel in mm: 2.00 Speed rpm: 350...390

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 13.30...13.70

2nd speed rpm : 900

Rack travel in m: 12.80...13.00

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm hPa : 900 Pressure

Rack travel mm : 13.10...13.20

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.80...11.20

2nd pressure hPa : 450

Rack travel in m: 12.60...12.70

3rd pressure hPa : 300

Rack travel in m: 11.60...11.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 rpm : 900 Speed

Del.quantity cm3/: 175.0...179.0

1000 s: (173.0...181.0)

Aneroid pressure h: -

rpm : 500 Speed

Det.quantity cm3/: 132.0...134.0

1000 s: (129.0...137.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.80

rpm : 1045...1060 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 150.0...170.0 1000 s: (146.0...174.0)

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 5.90...6.10

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

Test sheet : DAF 11.7 m Edition : 17.09.90

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 846 566

Injection pump

Pump designation : PE6P110A320RS526 EP type number : 0 411 816 147

Governor

Governor design. : RQ275/1000PA818-3

Governer no. : 0 421 80 534

Customer—spec. information Customer : DAF

Engine : LT 160 G

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening.

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 13.00...14.00

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 8 maximum rack tra: 13.0...14.0 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 15.6...15.8

100 s: (15.3...16.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0
Rack travel in mm : 7.4...7.8
Del.quantity cm3/: 2.2...2.7

100 s: (1.9...2.9)

Spread cm3 : 0.4 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 600

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm: 600 Aneroid pressure h: 700

Del.quantity : 156.0...158.0 1000 : (153.5...160.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 15.8

Testing:

1st rack travel in: 12.40

Speed rpm : 1030...1045

2nd rack travel in: 4.00

rpm : 1090...1120 Speed 4th rack travel in: 1250

: 0.00...1.00 Speed rom

LOW IDLE 1

Setting point w/out bumper spring

: 300 Speed rom Rack travel in mm: 7.1

Testing:

Speed : 100 rpm Minimum rack trave: 8.50 : 300 rom

Rack travel in mm : 7.00...7.20

Rack travel in mm : 2.00 : 380...420 Speed rom

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

rpm : 980 1st speed

Rack travel in m: 13.40...13.60

rpm : 600 2nd speed

Rack travel in m: 14.40...14.60

: 825 3rd speed rpm

Rack travel in m: 13.60...13.80

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm hPa : 700 Pressure

: 14.20...14.30 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 12.70...12.90

2nd pressure hPa : 290

Rack travel in m: 13.90...14.00

3rd pressure hPa : 260

Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 : 980 Speed rpm

Del.quantity cm3/: 136.0...138.0 1000 s: (132.0...142.0)

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 122.0...124.0 1000 s: (119.5...126.5) BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.40

rpm : 1030...1045 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 280.0...320.0 1000 s: (276.0...324.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm

Rack travel in mm : 7.40...7.80 Del.quantity cm3/: 22.0...27.0 1000 s: (19.5...29.5)

cm3 : 4.50

Spread 1000 s: (7.50)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

Test sheet Edition

: DAF 8,3 p 8 : 31.07.90

Replaces

Test oil

: ISO-4113

Combination no.

: 0 401 846 899

Injection pump

Pump designation : PE6P110A720RS3225

EP type number : D 411 816 763

Governor

Governor design. : RQ250/1200PA913-1

: 0 421 80 536 Governer no.

Customer-spec. information : DAF

Customer

: HS 200 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina (

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 12.4...12.6

100 s: (12.1...12.8)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.02nd speed

Rack travel in mm: 7.2...7.4

Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1)

Spread

cm3 : 0.4 100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 550 Speed

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 124.0...128.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm

Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.50 Speed rpm : 1235...1250

2nd rack travel in: 4.00

: 1300...1330 Speed rpm

4th rack travel in: 1450

: 0.00...1.40 Speed rpm

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm : 5.3 Testing: Speed rpm : 100 Minimum rack trave: 6.70 Speed rpm : 250 Rack travel in mm : 5.20...5.40 Rack travel in mm : 2.00 Speed rpm : 320...360 TORQUE CONTROL Dimension a mm : -Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.80...12.90 2nd speed rpm : 1200 Rack travel in m: 12.70...12.90 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 600 hPa : 1000 Pressure Rack travel mm : 12.50...12.60 Measurement 1/min : 600Speed 1st pressure hPa : -Rack travel in m: 10.90...11.10 2nd pressure hPa : 360 Rack travel in m: 12.10...12.20 3rd pressure hPa : 270 Rack travel in m: 11.40...11.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/: 87.0...89.0 1000 s: (84.5...91.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.50 rpm : 1235...1250 Speed LOW IDLE rpm : 250 Speed

Rack travel in mm : 5.20...5.40
Remarks:

D28

Note remarks

: DAF 8,3 p 7 : 14.09.90 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 899

Injection pump

Pump designation : PE6P110A720RS3225

: 0 411 816 763 EP type number

Governor

Governor design. : RQ275/1200PA913-1

: 0 421 801 549 Governer no.

Customer-spec. information Customer : DAF

Engine : HS 200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

BASIC SETTING

rpm: 10001st speed

Rack travel in mm : 12.50...12.60

Del.guantity cm3/: 12.4...12.6

100 s: (12.1...12.8)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 275.0 Rack travel in mm : 7.2...7.4 Del.quantity cm3/ : 1.4...1.9

100 s: (1.1...2.1)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 550 Speed

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1000

: 124.0...126.0 Del.quantity

1000 : (121.5...128.5)

: 4.00 Spread cm3

: (7.50) 1000

RATED SPEED

1st version

Setting point:

Speed

Rack travel in mm: 15.8

Testing:

1st rack travel in: 11.50 Speed rpm : 1235...1250

2nd rack travel in: 4.00

rpm : 1320...1350 Speed

4th rack travel in: 1450

rpm : 0.00...1.40Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275 Rack travel in mm : 5.3 Testina: : 100 Speed rom Minimum rack trave: 6.70 rpm : 275 Speed Rack travel in mm: 5.20...5.40
Rack travel in mm: 2.00
Speed rpm: 340...380 TORQUE CONTROL Dimension a mm : -Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.80...12.90 2nd speed rpm : 1200 Rack travel in m: 12.70...12.90 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure Rack travel mm : 12.50...12.60 Measurement 1/min : 600Speed 1st pressure hPa : -Rack travel in m: 10.90...11.10 2nd pressure hPa : 360 Rack travel in m: 12.10...12.20 3rd pressure hPa : 270 Rack travel in m: 11.40...11.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 87.0...89.0 1000 s: (84.5...91.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.50 rpm : 1235...1250 Speed LOW IDLE

rpm : 275

Rack travel in mm : 5.20...5.40 Remarks:

E02

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.80...2.90 : (2.75...2.95) Note remarks Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 : VOL 12,2 d Firina order Test sheet : 14.09.90 Edition : 13.10.89 Replaces Test oil : ISO-4113 : 0-60-120-180-240-300 Phasing Combination no. : 0 401 846 900 : 0.50 (0.75) Tolerance + - ° Injection pump Pump designation : PE6P120A320RS3240 Time to cyl. no. : 1 : 0 411 826 786 EP type number BASIC SETTING Governor : RQV250...1025PA921-Governor design. rpm: 700 1st speed 16 : 0 421 813 799 Governer no. Rack travel in mm : 13.60...13.70 Customer-spec. information Del.guantity cm3/: 25.1...25.3 : VOLVO-TRUCK Customer 100 s: (24.8...25.6) : TD122FL Enaine : 298.0 cm3 : 0.5Spread 1st version kW : 2050 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 250.0 2nd speed Rack travel in mm: 6.5...6.7 Test oil Del.quantity cm3/: 1.7...2.3 inlet temp. °C : 38...42 100 s: (1.5...2.5) cm3 : 0.5Overflow valve Spread 100 s: (0.7) : 1 457 413 010 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder assembly : 1 688 901 019 GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 1.00...1.40 travel mm Openina : 450 : 207...210 2nd speed pressure, bar rpm : 3.60...4.20 travel mm rpm : 800 Orifice plate 3rd speed : 6.30...6.70 : 0,8 travel mm diameter mm rpm : 1070 4th speed : 8.00...8.20 travel mm rpm : 1150 Test lines : 1 680 750 067 5th speed : 9.30...9.70 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION Control-lever position x Length mm : 6.00x1.50x1000 Degree: -1 rpm : 1100 (A) Injection pump setting values Speed Rack travel in mm : 15.20...17.80 Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values

1st version

Speed

rpm : 700

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Aneroid pressure h: 1200

Del.quantity : 251.0...253.0

1000 : (248.0...256.0)

Spread

cm3: 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 116...124

Testing:

1st rack travel in: 12.60

rpm : 1065...1075 Speed

2nd rack travel in: 4.00

Speed rpm : 1140...170 4th rack travel in: 1250

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 60...68

Testing:

: 100 Speed rom

Minimum rack trave: 8.10 Speed rpm : 250

Rack travel in mm : 6.50...6.70

CONSTANT REGULATION

rpm : 250...380 Speed

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 500 rpm Pressure hPa : 1200

Rack travel mm : 13.60...13.70

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 9.60...9.80

2nd pressure hPa : 100

Rack travel in m: 9.90...10.00

3rd pressure hPa : 810

Rack travel in m: 13.10...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed

rpm : 700

Del.quantity cm3/: 154.0...156.0

1000 s: (151.0...159.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.60

rpm : 1065...1075 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 220.0...260.0 1000 s: (216.0...264.0) Rack travel in mm: 20.00...21.00

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 6.50...6.70

Del.quantity cm3/: 17.5...23.5 1000 s: (15.0...25.0) Spread cm3: 5.00 1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Start-of-delivery setting with ROBO

diaphragm.

: 2.80...2.90 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (2.75...2.95) Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order Test sheet : VOL 12,2 d1 : 14.09.90 Edition : 13.10.89 Replaces : 0-60-120-180-240-300 : ISO-4113 Phasing Test oil Combination no. : 0 401 846 901 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 Injection pump Pump designation : PE6P120A320RS3240-1 : 0 411 826 787 BASIC SETTING EP type number Governor Governor design. : RQV250...950PA921-17 Governer no. : 0 421 813 800 rpm : 700 1st speed Governer no. Rack travel in mm : 12.70...12.80 Customer-spec. information Del.guantity cm3/: 22.3...22.5 : VOLVO-TRUCK Customer 100 s: (22.0...22.8) : TD122FH Engine cm3 : 0.5: 269.0 Spread 1st version kW : 1900 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 250.0 2nd speed Rack travel in mm: 6.5...6.7 Test oil Del.quantity cm3/: 1.7...2.2 inlet temp. °C : 38...42 100 s: (1.5...2.5) cm3 : 0.5Overflow valve Spread 100 s: (0.7) : 1 457 413 010 Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 019 assembly GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 1.00...1.40 Openina travel mm rpm : 350 : 207...210 pressure, bar 2nd speed : 2.20...2.80 rpm : 750 travel mm Orifice plate 3rd speed : 6.30...6.70 travel mm diameter mm : 0,8 rpm : 995 4th speed : 8.20...8.40 travel mm Test lines : 1 680 750 067 5th speed rpm : 1060 : 9.30...9.70 travel mm Outside diameter GUIDE SLEEVE POSITION x Wall thickness : 6.00X1.50X1000 Control-lever position x Lenath mm Degree: -1 rpm : 1010 (A) Injection pump setting values Speed Insp. values in parentheses

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 900

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 223.0...225.0 Del.quantity

1000 : (220.0...228.0)

cm3: 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testina:

1st rack travel in: 11.70

rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1050...1080 Speed

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 60...68

Testina:

rpm : 100 Speed Minimum rack trave: 8.10

rpm : 250 Speed

Rack travel in mm : 6.50...6.70

CONSTANT REGULATION

rpm : 250...380 Speed

Aneroid/Altitude

Compensator Test

1st version

Settina

: 500 Speed rom

hPa : 900 Pressure

Rack travel mm : 12.70...12.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.70...9.90

2nd pressure hPa : 90

Rack travel in m: 10.00...10.10

3rd pressure hPa : 470

Rack travel in m: 12.10...12.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/: 154.0...156.0

1000 s: (151.0...159.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.70

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 220.0...260.0

1000 s: (216.0...264.0) Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 6.50...6.70 Del.quantity cm3/: 17.5...22.5 1000 s: (15.0...25.0) Spread cm3 : 5.00 1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Start-of-delivery setting with ROBO

diaphragm.

Note remarks

: DAF 8,3 p 5 : 17.05.90 Test sheet Edition

: 4.5.90 Replaces : ISO-4113 Test oil

: 0 401 846 905 Combination no.

Injection pump

Pump designation : PE6P110A720RS3225Z

: 0 411 816 762 EP type number

Governor

Governor design. : RQ250/1200PA913 : 0 421 801 477 Governer no.

Customer-spec. information : DAF Customer

: HT 168 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.30...12.40

Del.guantity cm3/: 12.0...12.2

100 s: (11.7...12.4)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm: 7.2...7.4

Del.guantity cm3/: 1.4...1.9

100 s: (1.1...2.1)

cm3 : 0.4 100 s: (0.7) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 550 Speed

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

Aneroid pressure h: 1000

Del.quantity : 120.0...22... 1000 : (117.5...124.5)

: 4.00 cm3 Spread

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.30

rpm : 1235...1250 Speed

2nd rack travel in: 4.00

rpm : 1320...1350

4th rack travel in: 1400

rpm : 0.00...1.40Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm Rack travel in mm: 5.8 Testing: rpm : 100 Speed Minimum rack trave: 8.00 Speed rpm : 250 Rack travel in mm : 5.70...5.90 Rack travel in mm : 2.00 Speed rpm : 320...360 TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.60...12.70 2nd speed rpm : 1200 Rack travel in m: 12.50...12.70 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure Rack travel mm : 12.30...12.40 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.80...10.90 2nd pressure hPa : 395 Rack travel in m: 12.00...12.10 3rd pressure hPa : 320 Rack travel in m: 11.50...11.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/ : 83.5...85.5 1000 s: (81.0...88.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.30 rpm : 1235...1250 Speed LOW IDLE

: 250

rpm

Speed

E08

Rack travel in mm : 5.70...5.90
Remarks:

Note remarks

Test sheet : DAF 8,3 p10 : 20.07.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 905

Injection pump

Pump designation : PE6P110A720RS3225Z

: 0 411 816 762 EP type number

Governor

Governor design. : RQ250/1200PA913-1

: 0 421 801 536 Governer no.

Customer-spec. information : DAF Customer

: HT 168 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.30...12.40

Del.guantity cm3/: 12.0...12.2

100 s: (11.7...12.4)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm: 7.2...7.4

Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1)

cm3 : 0.4Spread 100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 550 Speed

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000Speed Aneroid pressure h: 1000

Del.quantity : 120.0...124.5)

: 4.00 cm3 Spread

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.30

rpm : 1235...1250 Speed

2nd rack travel in: 4.00

rpm : 1320...1350 Speed

4th rack travel in: 1400

: 0.00...1.40 Speed rpm

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm Rack travel in mm : 5.8 Testina: Speed rpm : 100 Minimum rack trave: 8.00 rpm : 250 Speed Rack travel in mm: 5.70...5.90 Rack travel in mm : 2.00 Speed rpm : 320...360 TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.60...12.70 2nd speed rpm : 1200 Rack travel in m: 12.50...12.70 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom hPa : 1000 Pressure : 12.30...12.40 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : -Rack travel in m: 10.80...10.90 2nd pressure hPa : 395 Rack travel in m: 12.00...12.10 3rd pressure hPa : 320 Rack travel in m: 11.50...11.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 83.5...85.5 1000 s: (81.0...88.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.30 rpm : 1235...1250 Speed

rpm : 250

LOW IDLE

Speed

E10

Rack travel in mm : 5.70...5.90 Remarks:

Note remarks

: DAF 8,3 p 9 Test sheet : 14.09.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 905

Injection pump

Pump designation : PE6P110A720RS3225Z

: 0 411 816 762 EP type number

Governor

Governor design. : RQ275/1200PA913-1

: 0 421 801 549 Governer no.

Customer-spec. information Customer : DAF

Engine : HT 168

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina .

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 12.0...12.2

100 s: (11.7...12.4)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 275.0 2nd speed Rack travel in mm: 7.2...7.4

Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1) cm3 : 0.4 Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 550 Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

Aneroid pressure h: 1000

: 120.0...122.0 Del.quantity

1000 : (117.5...124.5)

: 4.00 : (7.50) cm3 Spread

1000

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.30

rpm : 1235...1250 Speed

2nd rack travel in: 4.00

rpm : 1320...1350 Speed

4th rack travel in: 1400

rpm : 0.00...1.40Speed

LOW IDLE 1

Setting point w/out bumper spring

: 275 Speed rpm Rack travel in mm: 5.8 Testina: rpm : 100 Speed Minimum rack trave: 8.00 rpm : 275 Speed Rack travel in mm : 5.70...5.90 Rack travel in mm : 2.00 : 340...380 Speed rpm TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 12.60...12.70 2nd speed rpm : 1200 Rack travel in m: 12.50...12.70 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure : 12.30...12.40 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.80...10.90 2nd pressure hPa : 395 Rack travel in m: 12.00...12.10 3rd pressure hPa : 320 Rack travel in m: 11.50...11.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 83.5...85.5 1000 s: (81.0...88.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.30 Speed rpm : 1235...1250 LOW IDLE

rpm : 275

Speed

E12

Rack travel in mm : 5.70...5.90 Remarks:

Note remarks

Test sheet : VOL 10,0 u2 : 20.07.90 Edition : 6.4.90 Replaces

: ISO-4113 Test oil

: 0 401 846 921 Combination no.

Injection pump

Pump designation : PE6P110A320RS3197 : 0 411 816 752

EP type number

Governor

Governor design. : RQV250...1100PA589 Governor no. : 0 421 817 307 Governer no.

Customer-spec. information

: VME Customer

: TD102 KF Engine

: 200.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.50...3.60 Prestroke mm

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm : 7001st speed

Rack travel in mm : 11.70...11.80

Del.guantity cm3/: 16.2...16.4

100 s: (15.9...16.7)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.0 2nd speed

Rack travel in mm : 4.5...4.9 Del.quantity cm3/ : 2.5...2.9

100 s: (2.2...3.2) cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

: 1.00...1.40 travel mm

2nd speed rpm : 350

: 2.20...2.70 travel mm

rpm : 4503rd speed

: 3.70...4.10 travel mm

rpm : 750 4th speed

: 6.30...6.70 rpm : <u>1</u>160 travel mm

5th speed

: 7.90...8.10 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1180

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Aneroid pressure h: 1000

Del.quantity : 162.0...164.0 1000 : (159.0...167.0)

: 4.00 Spread cm3 1000 : (7.50)RATED SPEED 1st version Control lever position degrees: 115...123 Testina: 1st rack travel in: 10.70 rpm : 1160...1170 Speed 2nd rack travel in: 4.00 rpm : 1225...1255 Speed 4th rack travel in: 1350 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 60...68 Testing: Speed rpm : 100 Minimum rack trave: 5.90 Speed rpm : 250 Rack travel in mm : 4.30...4.50 CONSTANT REGULATION rpm : 250...380 Speed Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 1000 Pressure Rack travel mm : 11.70...11.80 Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 9.80...10.20 2nd pressure hPa : 390 Rack travel in m: 11.40...11.50 3rd pressure hPa : 180 Rack travel in m: 10.10...10.30 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 rpm : 1000 Speed Del.quantity cm3/: 146.0...150.0 1000 s: (143.0...153.0)

Del.quantity cm3/: 127.0...129.0 1000 s: (124.0...132.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.70 Speed rpm : 1160...1170

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...190.0
1000 s: (156.0...194.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.30...4.50

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.
Permissible alteration from 2.20...2.90

mm

Speed

Aneroid pressure h: -

rpm : 700

Note remarks

Test sheet : ENA 11,9 e1 : 14.09.90 Edition : 23.3.90 Replaces Test oil : ISO-4113

Combination no. : 0 401 846 922

Injection pump

Pump designation : PE6P12OA32ORS3176-3

: 0 411 826 793 EP type number

Governor

Governor design. : RQV250...1050PA808 Governor no. : 0 421 813 553

Customer-spec. information Customer : FNASA

: 96 R1 CX Engine

1st version kW : 221.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 3.80...3.90 Prestroke mm : (3.75...3.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 650

Rack travel in mm : 12.80...12.90

Del.quantity cm3/: 19.6...19.8

100 s: (19.3...20.1)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm: 7.2...7.6 Del.quantity cm3/: 2.5...3.1 100 s: (2.2...3.4)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.00...1.40 travel mm

rpm : 350 2nd speed : 1.90...2.50 travel mm

rpm : 700 3rd speed

travel mm : 4.50...5.10

4th speed rpm : 1095

: 8.00...8.20 travel mm

rpm : 1185 5th speed

: 9.00...9.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1110

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 650 Speed Aneroid pressure h: 900 Del.quantity : 190.0...201.0)

: 5.00 cm3 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testina:

1st rack travel in: 11.80

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1185...1215 Speed

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 79...87

Testina:

Speed rpm : 100

Minimum rack trave: 7.50

rpm

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 250...500 Speed

Aneroid/Altitude Compensator Test

1st version

Settina

: 500 Speed rom hPa : 900

Pressure

Rack travel mm : 12.80...12.90

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 9.80...10.20 2nd pressure hPa : 500 Rack travel in m: 12.30...12.40 3rd pressure hPa : 190

Rack travel in m: 10.40...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1030 Del.quantity cm3/: 208.0...214.0

1000 s: (205.0...217.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 123.0...125.0 1000 s: (120.0...128.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.80

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rpm

Del.quantity cm3/: 115.0...135.0 1000 s: (111.0...139.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 5.90...6.10

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,

the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : VOL 12,2 i Test sheet : 29.06.90 Edition Replaces : ISO-4113 Test oil Combination no. : 0 401 846 923 Injection pump Pump designation : PE6P120A320RS3118 EP type number : 0 411 826 726 Governor Governor design. : RQV250...1100PA920-6 : 0 421 813 872 Governer no. Customer-spec. information : VOLVO-TRUCK Customer : THD 102 KD Engine 1st version kW : 250.0 Spread : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve Spread : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate : 0,8 diameter mm : 1 680 750 067 Test lines Outside diameter x Wall thickness : 6.00x1.50x1000 x Lenath mm (A) Injection pump setting values

Prestroke mm : 2.60...2.70 : (2.55...2.75) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 1 BASIC SETTING rpm: 700 1st speed Rack travel in mm : 12.70...12.80 Del.quantity cm3/: 22.2...22.4 100 s: (21.9...22.7) cm3 : 0.5100 s: (0.9) rpm : 250.02nd speed Rack travel in mm: 4.3...4.5 Del.quantity cm3/: 2.7...3.3 100 s: (2.4...3.6) cm3 : 0.5 100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 1.00...1.40 travel mm rpm : 500 2nd speed : 4.10...4.70 travel mm rpm : 800 3rd speed : 6.30...6.70 travel mm rpm : 1140 4th speed travel mm : 7.70...7.90 : 1230 5th speed rpm : 9.00...9.40 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1175 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version

rpm : 700

Aneroid pressure h: 1200

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 222.0...224.0

1000 : (219.0...227.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 113...121

Testina:

1st rack travel in: 11.70

Speed rpm : 1130...1140

2nd rack travel in: 4.00

Speed rpm : 1200...1230

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever

position degrees: 60...68

Testina:

rpm : 100 Speed Minimum rack trave: 5.90

: 250 rom

Rack travel in mm : 4.30...4.50

CONSTANT REGULATION

rpm : 250...370 Speed

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 500 rom hPa : 1200 Pressure

: 12.70...12.80 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.30...8.50

2nd pressure hPa : 700

Rack travel in m: 12.50...12.60 3rd pressure hPa : 120

Rack travel in m: 9.00...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 131.0...133.0

1000 s: (128.0...136.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.70

rpm : 1130...1140 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 230.0...270.0 1000 s: (225.0...275.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 4.30 ... 4.50

Del.quantity cm3/: 27.0...33.0 1000 s: (24.0...36.0) Spread cm3: 5.00

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Note remarks

: DAF 8,3 q Test sheet : 10.08.90 Edition

Replaces

: ISO-4113 Test oil

: 0 401 846 927 Combination no.

Injection pump

Pump designation : PE6P110A720RS3258

EP type number : 0 411 816 771

Governor

Governor design. : RQ325/1200PA913-2

: 0 421 801 539 Governer no.

Customer-spec. information

: DAF Customer

: HT 168 G Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)
Rack travel in mm : 12.50...13.50
Firing order : 1-5-3-6-

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 7.80...8.00 & maximum rack tra: 12.5...13.5 Difference ° CS : 1.50...3.00

BASIC SETTING

rpm : 10001st speed

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 12.3...12.5

100 s: (12.1...12.8)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 325.02nd speed Rack travel in mm: 7.3...7.7

Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1) cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 550 Speed

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1000

: 123.5...125.5 Del.quantity

1000 : (121.0...128.0) cm3 : 4.00 Spread

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 550 Rack travel in mm : 15.8

Testina:

1st rack travel in: 11.90

rpm : 1235...1250 Speed

2nd rack travel in: 4.00

rpm : 1325...1355 Speed 4th rack travel in: 1500 Speed rpm : 0.00...1.00LOW IDLE 1 Setting point w/out bumper spring rpm : 275 Rack travel in mm: 6.3 Testing: Speed rpm : 100 Minimum rack trave: 8.00 rpm : 275 Speed Rack travel in mm : 6.20...6.40 Rack travel in mm : 2.00 rpm : 380...420 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.20...13.30 2nd speed rpm : 1200 Rack travel in m: 13.10...13.30 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm Pressure hPa : 1000 Rack travel mm : 12.90...13.00 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.90...11.10 2nd pressure hPa : 370 Rack travel in m: 12.40...12.50 3rd pressure hPa : 240 Rack travel in m: 11.40...11.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 81.5...83.5 1000 s: (79.0...86.0)

full load rack tr: 11.90 Speed rpm : 1235...1250

LOW IDLE

Speed rpm : 325 Rack travel in mm : 6.20...6.40

Remarks:

BREAKAWAY

1st version

1mm rack travel less than

Note remarks

: DAF 8,3 r Test sheet : 21.09.90 Edition

Replaces

: ISO-4113 Test oil

: 0 401 846 928 Combination no.

Injection pump

Pump designation : PE6P110A720RS3258 : 0 411 816 771 EP type number

Governor

Governor design. : RQV325...1200PA910-1 : 0 421 813 880 Governer no.

Customer—spec. information Customer : DAF

Engine : HT 168 G

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 12.50...13.50

: 1-5-3-6-Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 7.80...8.00 & maximum rack tra: 12.5...13.5 Difference ° CS : 1.50...3.00

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.30...13.40

Del.guantity cm3/: 12.3...12.5

100 s: (12.1...12.8)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 325.0 2nd speed Rack travel in mm: 7.7...8.1 Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1245 1st speed

: 8.10...8.30 travel mm rpm : 325 2nd speed

: 0.90...1.30 travel mm

3rd speed rpm : 500

travel mm : 2.90...3.50

rpm : 800 4th speed

: 4.60...5.00 travel mm

rpm : 1500 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1240 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rom : 1000Aneroid pressure h: 1000

Del.quantity : 123.5...125.5

1000 : (121.0...128.0)

cm3 : 4.00Spread 1000 : (7.50) RATED SPEED 1st version Control Lever position degrees: 116...124 Testing: 1st rack travel in: 12.30 Speed rpm : 1240...1250 2nd rack travel in: 4.00 rpm : 1345...1375 Speed 4th rack travel in: 1500 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 79...87 Testing: Speed rpm : 100 Minimum rack trave: 7.90 Speed rpm Rack travel in mm : 6.30...6.50 CONSTANT REGULATION rpm : 340...460 Speed Aneroid/Altitude Compensator Test 1st version Settina : 600 Speed rom Pressure hPa : 1000 : 13.30...13.40 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 11.50...11.70 2nd pressure hPa : 370 Rack travel in m: 12.80...12.90 3rd pressure hPa : 240 Rack travel in m: 11.80...12.10 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 81.5...83.5 1000 s: (79.0...86.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.30

rpm : 1240...1250 Speed

LOW IDLE

Speed rpm : 325 Rack travel in mm : 6.30...6.50

Remarks:

Note remarks

Test sheet : DAF 8,2 c : 17.09,90 Edition

Replaces

: ISO-4113 Test oil

: 0 401 846 929 Combination no.

Injection pump

Pump designation : PE6P110A720RS3257

EP type number : D 411 816 772

Governor

Governor design. : RQ325/1200PA913-2

: 0 421 801 539 Governer no.

Customer-spec. information

: DAF Customer

: HS 200 G Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80

**:** (3.65, ...3.85)

Rack travel in mm : 13.50...14.50 Firing order : 1-5-3-6-

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 7.40...7.60 & maximum rack tra: 13.5...14.5

Difference ° CS : 1.75...3.25

BASIC SETTING

rpm : 10001st speed

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 13.8...14.0

100 s: (13.5...14.2)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 325.0 Rack travel in mm : 7.7...8.1 Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 550 Speed

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

: 138.0...140.0 Del.quantity 1000 : (135.5...142.5)

cm3 : 4.00

Spread

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm

Rack travel in mm: 15.8

Testing:

1st rack travel in: 13.00

rpm : 1235...1250 Speed

2nd rack travel in: 4.00

rpm : 1325...1355 Speed 4th rack travel in: 1500 Speed rom : 0.00...1.00LOW IDLE 1 Setting point w/out bumper spring rpm : 325 Speed Rack travel in mm: 6.4 Testing: rpm : 100 Speed Minimum rack trave: 7.90 rpm : 325 Speed Rack travel in mm: 6.30...6.50 Rack travel in mm: 2.00 Speed rpm: 395...435 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 600 hPa : 1000 Pressure Rack travel mm : 14.00...14.10 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.80...11.00 2nd pressure hPa : 390 Rack travel in m: 13.30...13.40 3rd pressure hPa : 180 Rack travel in m: 11.80...12.00 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 80.5...82.5 1000 s: (78.0...85.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00 rpm : 1235...1250 Speed LOW IDLE rpm : 325

Remarks:

Rack travel in mm : 6.30...6.50

Note remarks

: DAF 8,2 d Test sheet : 17.09.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 930

Injection pump

Pump designation : PE6P110A720RS3257 : 0 411 816 772 EP type number

Governor

Governor design. : RQV325...1200PA910-1 Governer no. : 0 421 813 880

Customer-spec. information : DAF Customer

Engine : HS 200 G

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80

: (3.65...3.85) Rack travel in mm : 13.50...14.50

Firing order : 1-5-3-6-

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 7.40...7.60 & maximum rack tra: 13.5...14.5
Difference ° CS : 1.75...3.25

BASIC SETTING

rpm : 10001st speed

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 13.8...14.0

100 s: (13.5...14.2)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 325.0 Rack travel in mm : 7.7...8.1 Del.quantity cm3/ : 1.4...1.9

100 s: (1.1...2.1)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1245 1st speed

: 8.10...8.30 travel mm rpm : 325 2nd speed

: 0.90...1.30 travel mm

rpm : 500 3rd speed

: 2.90...3.50 travel mm rpm : 800 4th speed

: 4.60...5.00 travel mm

rpm : 1500 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1240 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1000 Aneroid pressure h: 1000

Del.quantity : 138.0...140.0 1000 : (135.5...142.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 13.00

rpm : 1240...1250 Speed

2nd rack travel in: 4.00

Speed rpm : 1360...1390

4th rack travel in: 1500

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 78...86

Testina:

rpm : 100 Speed Minimum rack trave: 7.90 rpm : 325 Speed

Rack travel in mm : 6.30...6.50

CONSTANT REGULATION

rpm : 340...460 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm hPa : 1000 Pressure

: 14.00...14.10 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 10.80...11.00

2nd pressure hPa : 390

Rack travel in m: 13.30...13.40

3rd pressure hPa : 180

Rack travel in m: 11.80...12.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 600 Speed

Del.quantity cm3/: 80.5...82.5 1000 s: (78.0...85.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.00

rpm : 1240...1250 Speed

LOW IDLE

: 325 Speed rpm

Rack travel in mm : 6.30...6.50

Remarks:

Note remarks

Test sheet : DAF 11,7 h2 : 03.08.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 931

Injection pump

Pump designation : PE6P120A320RS3248 : D 411 826 792 EP type number

Governor

Governor design. : RQV250...1000PA851-5 Governer no. : 0 421 813 877

Customer-spec. information : DAF Customer

Engine : WS 222

: 222.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.20...4.30 Prestroke mm : (4.15...4.35)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 18.9...19.1

100 s: (18.6...19.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm : 6.5...6.7 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1045 1st speed

: 7.80...8.00 travel mm

rpm : 250 2nd speed

travel mm : 0.70...1.10 3rd speed : 400 rpm

2.50...3.10 travel mm

rpm : 750 4th speed

: 4.80...5.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1075 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

Aneroid pressure h: 1000

: 189.0...191.0 Del.quantity 1000 : (186.0...194.0)

: 5.00 cm3 Spread

1000 : (9.00) RATED SPEED

1st version

Control lever

position degrees: 114...122

Testing:

1st rack travel in: 10.80 Speed rpm : 1040...1050 2nd rack travel in: 4.00

rpm : 1120...1150 Speed

4th rack travel in: 1250

rpm : 0.00...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 79...87

Testing:

Speed rpm : 100 Minimum rack trave: 7.50

rpm : 250

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 260...380 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 600 rpm hPa : 1000 Pressure

Rack travel mm : 11.80...11.90

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 11.00...11.20

2nd pressure hPa : 230

Rack travel in m: 11.40...11.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600 Del.quantity cm3/: 164.0...166.0 1000 s: (161.0...169.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.80

rpm : 1040...1050 Speed

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

E28

Note remarks

Test sheet : DAF 8,2 b 1 : 31.08.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 932

Injection pump

Pump designation : PE6P120A320RS3183-3

: 0 411 826 794 EP type number

Governor

Governor design. : RQ275/1100PA832-4

: 0 421 801 537 Governer no.

Customer—spec. information

Customer : DAF

: ks 260 s Engine

1st version kW : 260.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 21.0...21.2

100 s: (20,7...21.5)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 275.0 2nd speed

Rack travel in mm: 6.6...7.0 Del.guantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 550 Speed

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

Aneroid pressure h: 1000

: 210.0...212.0 Del.quantity 1000 : (207.0...215.0)

cm3 : 5.00

Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm

Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.70 Speed rpm : 1125...1140

2nd rack travel in: 4.00

rpm : 1215...1245 Speed 4th rack travel in: 1350

: 0.00...1.40 Speed rpm

LOW IDLE 1

Setting point w/out bumper spring

: 275 rpm Rack travel in mm: 6.8

Testing:

Speed : 100 rpm Minimum rack trave: 8.30 : 275 rpm

Rack travel in mm : 6.70...6.90

Rack travel in mm : 2.00 Speed rpm : 395...435

TORQUE CONTROL

Dimension a mm

Torque control curve – 1st version

1st speed rpm : 850

Rack travel in m: 13.00...13.10

: 1100 2nd speed rpm

Rack travel in m: 12.90...13.10

Aneroid/Altitude

Compensator Test

1st version

Setting

: 600 Speed rpm

hPa : 1000 Pressure

: 12.70...12.80 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 500 Rack travel in m: 12.10...12.20

3rd pressure hPa : 340

Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 600 Speed

Del.guantity cm3/: 148.0...150.0

1000 s: (145.0...153.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.70

rpm : 1125...1140 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 260.0...300.0

1000 s: (256.0...304.0)

LOW IDLE

Speed : 275 rpm

Rack travel in mm : 6.60...7.00 Del.quantity cm3/: 14.0...20.0

1000 s: (11.0...23.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

: HAE 12,0 a : 16.08.90 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 933

Injection pump

Pump designation : PE6P110A320RS3260

: 0 411 816 775 EP type number

Governor

Governor design. : RQ250/1050PA969 Governer no. : 0 421 801 538

Customer-spec. information Customer : HAEP

Engine : X6130 NA

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.60...3.70 Prestroke mm

: (3.55...3.75)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 10501st speed

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 13.5...13.8

100 s: (13.2...14.0)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.02nd speed Rack travel in mm: 8.5...8.9

Del.guantity cm3/: 2.7...3.2 100 s: (2.4...3.4)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 550 Speed

Rack travel in mm : 14.60...16.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

: 135.0...138.0 Del.quantity 1000 : (132.5...140.5)

cm3 : 4.00 Spread

: (7.50) 1000

RATED SPEED

1st version

Setting point:

Speed rpm

Rack travel in mm: 15.4

Testing:

1st rack travel in: 11.10 Speed rpm : 1095...1110

2nd rack travel in: 4.00

rpm : 1130...1160 Speed

4th rack travel in: 1250

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm : 8.7

Testina:

: 100 Speed rpm Minimum rack trave: 10.20 rpm : 250 Speed

Rack travel in mm : 8.60...8.80

TORQUE CONTROL

Torque control curve - 1st version 1st speed rpm : 1050

Rack travel in m: 12.10...12.20

2nd speed rpm : 600

Rack travel in m: 13.00...13.20 3rd speed rpm : 760 Rack travel in m: 12.70...12.90

4th speed rpm : 870

Rack travel in m: 12.20...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600 Del.quantity cm3/: 138.0...142.0

1000 s: (135.0...145.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.10

rpm : 1095...1110 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 170.0...190.0

1000 s: (166.0...194.0)

Remarks:

: 3.80...3.90 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.75...3.95) Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order : ENA 11,9 k Test sheet : 21.09.90 Edition Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasing : 0.50 (0.75) Combination no. : 0 401 846 934 Tolerance + - ° Injection pump Time to cyl. no. : 1 Pump designation : PE6P120A320RS3176-4 : 0 411 826 795 BASIC SETTING EP type number Governor rpm: 1000 Governor design. : RQ250/1000PA218-3 1st speed : 0 421 801 541 Governer no. Rack travel in mm : 10.10...10.20 Customer-spec. information Del.quantity cm3/: 17.4...17.6 Customer : ENASA 100 s: (17.1...17.9) : 96 T4 EZ Engine cm3 : 0.51st version kW : 176.0 Spread : 2000 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 250.0 Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 2.5...2.1 Test oil inlet temp. °C : 38...42 100 s: (2.2...3.4) cm3 : 0.8Overflow valve Spread : 1 417 413 025 100 s: (1.2) GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Degree: -1 Test nozzle holder : 0 688 901 019 rpm : 600 assembly Speed Rack travel in mm : 15.60...16.40 Opening : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP pressure, bar 1st version Orifice plate diameter mm : 0,8 Speed rpm : 1000Aneroid pressure h: 700 : 174.0...176.0 Del.quantity 1000 : (171.0...179.0) Test lines : 1 680 750 067 : 5.00 Spread cm3 1000 : (9.00) Outside diameter x Wall thickness : 6.00x1.50x1000 RATED SPEED x Length mm 1st version (A) Injection pump setting values Insp. values in parentheses Setting point: Set equal delivery quant. : 600 rpm per values Speed Rack travel in mm: 16.0 BEGINNING OF DELIVERY Test pressure, bar: 25...27 Testing:

1st rack travel in: 9.10

rpm : 1045...1060 Speed

2nd rack travel in: 4.00

rpm : 1100...1130 Speed

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 6.0

Testina:

: 100 Speed rpm Minimum rack trave: 7.50 Speed rpm: 250
Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: 350...390

Aneroid/Altitude Compensator Test

1st version Setting

pm : 500 hPa : 700 Speed rom Pressure

Rack travel mm : 10.10...10.20

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 8.40...8.80

2nd pressure hPa : 170

Rack travel in m: 9.80...9.90

3rd pressure hPa : 120

Rack travel in m: 9.00...9.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 117.0...119.0 1000 s: (114.0...122.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.10

rpm : 1045...1060 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 150.0...170.0 1000 s: (146.0...174.0)

Rack travel in mm : 19.50...21.00

•

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Note remarks

Test sheet : MB 11,0 s18 : 17.09.90 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 936

Injection pump

Pump designation: PE6P110A320LS3835-1

: 0 411 816 755 EP type number

Governor

Governor design. : RQ300/900PA187-14

: 0 421 801 357 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: OM441 Engine

: 150.0 1st version kW : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10

: (3.95...4.15)

Rack travel in mm : 9.00...12.00

: 6-3-5-2-4-1 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 12.6...12.8

100 s: (12.3...13.0)

cm3 : 0.4Spread

100 s: (0.8)

rpm : 300.02nd speed Rack travel in mm: 8.0...8.2

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.4)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 650 Rack travel in mm : 13.20...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

: 126.0...128.0 Del.quantity 1000 : (123.5...130.5)

: 4.00 cm3

Spread

: (8.00) 1000

RATED SPEED

1st version

Setting point:

: 650 rpm Rack travel in mm: 13.6

Testing:

1st rack travel in: 11.50

rpm : 940...950 Speed

2nd rack travel in: 4.00 rpm : 985...1015 Speed 4th rack travel in: 1100

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 8.1

Testing:

rpm : 100 Speed Minimum rack trave: 9.30

Speed rpm : 300
Rack travel in mm : 8.00...8.20
Rack travel in mm : 2.00

rpm : 430...470 Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600 Del.quantity cm3/ : 124.0...128.0 1000 s: (121.0...131.0)

cm3 : 6.00 Spread

1000 s: (9.00)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.50 rpm : 940...950 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0

1000 s: (126.0...154.0)

: 3.40...3.50 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.35...3.55) Rack travel in mm : 9.00...12.00 Note remarks : 8- 7- 2- 6- 3- 5-Firing order : MB 12,8 i 1 : 31.07.90 Test sheet Edition Replaces : ISO-4113 Test oil Phasing : 0-45-90-135-180-225-270-315 Combination no. : 0 401 848 077 : 0.50 (0.75) Tolerance + - ° Injection pump Pump designation: PE8P100A320LS845 Time to cyl. no. : 8 EP type number : 0 411 808 055 BASIC SETTING Governor Governor design. : RQ300/1250PA187R : 0 421 801 034 rpm: 1250 Governer no. 1st speed Rack travel in mm : 10.00...10.10 Customer-spec. information Customer : MERCEDES-BENZ Del.guantity cm3/: 10.2...10.4 : OM 402 Engine 100 s: (10.0...10.6) : 188.3 : 2500 1st version kW cm3 : 0.3Spread Rated speed 100 s: (0.6) TEST BENCH REQUIREMENTS rpm : 300.0 Test oil 2nd speed inlet temp. °C Rack travel in mm: 6.9...7.3 : 38...42 Del.quantity cm3/: 1.3...1.9 100 s: (1.0...2.1) Overflow valve cm3 : 0.3: 1 417 413 025 Spread 100 s: (0.5) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Overflow quantity min. 1/h: 100...120 Degree: -1 rpm : 600 Speed Rack travel in mm : 13.30...14.60 Test nozzle holder assembly : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP Openina pressure, bar : 172...175 1st version rpm : 1250 Speed : 102.0...104.0 Del.quantity : (100.0...106.0) : 1 680 750 015 1000 Test lines : 3.00 Spread cm3 1000 : (6.00) Outside diameter x Wall thickness : 6.00x1.50x600 RATED SPEED x Length mm 1st version (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. Setting point: : 600 per values Speed rpm Rack travel in mm: 13.9 BEGINNING OF DELIVERY Test pressure, bar: 25...27 Testina:

1st rack travel in: 9.00

rpm : 1295...1310 Speed

2nd rack travel in: 4.00

rpm : 1335...1365 Speed

4th rack travel in: 1400

rpm : 0.00...1.50Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 7.1

Testing:

rpm : 200 Speed Minimum rack trave: 8.00 Speed rpm : 300

Rack travel in mm : 6.90...7.30 Rack travel in mm : 2.00

Speed rom : 415...455

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 10.00...10.10

2nd speed rpm : 600

Rack travel in m: 10.00...10.20

RACK STOP ADJUSTMENT

rpm : 600 Speed

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.00

rpm : 1295...1310 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 120.0...140.0

1000 s: (116.0...144.0)

Note remarks

Test sheet : MB 14,6 c 2 : 06.07.90 Edition : 7.10.88 Replaces : ISO-4113 Test oil

: 0 401 848 712 Combination no.

Injection pump

Pump designation : PE8P110A320LS3802-10

: 0 411 818 710 EP type number

Governor

Governor design. : RQV300...1150PA524-2 Governer no. : 0 421 813 264

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M422 Engine

: 206.0 1st version kW Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...0

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 Prestroke mm : (3.95...4.15)

Rack travel in mm : 9.00...12.00

: 8- 7- 2- 6- 3- 5-Firing order

4- 1

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm: 7501st speed

Rack travel in mm : 11.70...11.80

Del.guantity cm3/: 11.4...11.6

100 s: (11.1...11.8)

Spread cm3 : 0.4

rpm : 300.02nd speed Rack travel in mm: 7.9...8.1 Del.guantity cm3/: 1.5...2.1

100 s: (1.2...2.3)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.60...2.00 travel mm

rpm : 800 2nd speed

: 5.80...6.30 rpm : 1200 travel mm

3rd speed

: 8.00...8.60 travel mm

: 1250 4th speed rpm

: 9.00...9.80 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1190 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 750 Speed

Del.quantity

: 114.0...116.0 : (111.5...118.5) 1000

Spread cm3 : 4.00

## RATED SPEED

1st version Control lever

position degrees: 51...59

Testing:

1st rack travel in: 10.70

Speed rpm : 1190...1200

2nd rack travel in: 4.00

rpm : 1240...1270 Speed

LOW IDLE 1

Control lever

position degrees: 18...26

Testing:

: 100 Speed rpm Minimum rack trave: 9.60 Speed rpm : 300 Rack travel in mm : 7.90...8.10

Rack travel in mm : 2.00

rpm : 430...490 Speed

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1150 Del.quantity cm3/ : 132.0...137.0 1000 s: (129.0...140.0)

cm3 : 7.00Spread

1000 s: (10.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.70

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 130.0...150.0

1000 s: (126.0...154.0)

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MB 14,7 d 6 : 11.11.89 : 29.3.89 Test sheet Edition Replaces Test oil : ISO-4113 Combination no. : 0 401 848 795 Injection pump : 0 411 818 714 EP type number Governor : 0 421 813 686 Governer no. Customer-spec. information : DAIMLER-BENZ Customer : 0M442 Engine 1st version kW : 213.0 : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 0 681 343 009 assembly Opening | : 172...175 pressure, bar Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600

Pump designation : PE8P110A320LS3842 Governor design. : RQV300..1050PA884-1 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 4.00...4.10 Prestroke mm : (3.95...4.15) Rack travel in mm : 9.00...12.00 : 8- 7- 2- 6- 3- 5-Firing order 4-1 Phasing : 0-45-90-135-180-225-270-315 : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 8 BASIC SETTING rpm : 750 1st speed Rack travel in mm : 12.70...12.80 Del.quantity cm3/: 12.6...12.8 100 s: (12.3...13.0) cm3 : 0.4Spread 100 s: (0.7) rpm : 300.02nd speed Rack travel in mm: 8.4...8.8 Del.quantity cm3/: 1.5...2.1 100 s: (1.2...2.3) cm3 : 0.4Spread 100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 3001st speed : 1.10...1.40 travel mm rpm : 800 2nd speed travel mm : 5.80...6.20 rpm : 1100 3rd speed : 8.20...8.60 travel mm rpm : 1150 4th speed : 9.10...9.70 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1130 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 750 Speed : 126.0...128.0 Del.quantity 1000 : (123.5...130.5)

: 4.00 cm3 Spread 1000 : (7.50) RATED SPEED 1st version Control lever position degrees: 53...61 Testing: 1st rack travel in: 11.70 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm : 1150...1180 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 18...26 Testing: rpm : 200 Speed Minimum rack trave: 10.00 rpm : 300 Rack travel in mm : 6.80...7.00 CONSTANT REGULATION rpm : 300...400 Speed START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1050 Speed Del.quantity cm3/: 136.0...140.0 1000 s: (133.0...143.0) cm3 : 7.00 1000 s: (10.0) Spread **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.70 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Note remarks

: MB 14,7 r : 20.07.90 Test sheet Edition : 12.4.90 Replaces : ISO-4113 Test oil

: 0 401 848 808 Combination no.

Injection pump

Pump designation : PE8P110A320LS3846-1

: 0 411 818 719 EP type number

Governor

Governor design.: RQV300...1050PA884-5

: 0 421 813 831 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M442

1st version kW : 213.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 101 assembly

Openina .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.40...4.50 Prestroke mm

: (4.35...4.55)

Rack travel in mm : 9.00...12.00 Firing order : 8-7-2-6-3-5-

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 12.2...12.4

100 s: (11.9...12.6)

cm3 : 0.8Spread

100 s: (1.3)

2nd speed rpm : 300.0 Rack travel in mm : 7.2...7.8 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.4)

cm3 : 0.6Spread 100 s: (1.1)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.00...1.50 travel mm

rpm : 440 2nd speed

: 2.70...3.20 travel mm

rpm : 730 3rd speed

: 4.70...5.20 travel mm

1110 4th speed rpm :

: 8.00...8.50 travel mm

rpm : 1360 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1100 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

: 122.0...124.0 Del.quantity

1000 : (119.5...126.5)

cm3 : 8.50 Spread 1000 : (13.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 10.70

rpm : 1090...1°00 Speed

2nd rack travel in: 4.00

Speed rpm : 1180...1210 4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 85...93

Testing:

Speed : 200 rpm Minimum rack trave: 8.20 rpm : 300

Rack travel in mm : 6.30...6.90

CONSTANT REGULATION

rpm : 300...500 Speed

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 600 Speed

Del.quantity cm3/: 117.0...123.0 1000 s: (114.5...125.5) Spread cm3 : 11.00

1000 s: (14.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.70

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0)

Note remarks

Test sheet : MB 14,7 d 9 : 19.06.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 848 809

Injection pump

Pump designation : PE8P110A320LS3842-1

EP type number : D 411 818 716

Governor

Governor design. : RQV350...1050PA378-7

: 0 421 813 714 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M442 Engine

: 213.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 Prestroke mm

: (3.95...4.15)

Rack travel in mm : 9.00...12.00 : 8- 7- 2- 6- 3- 5-Firing order

4-1

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 13.7...13.9

100 s: (13.4...14.1)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 350.02nd speed

Rack travel in mm : 8.0...8.3 Del.quantity cm3/: 1.5...2.1 100 s: (1.2...2.3)

cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 3001st speed

: 1.50...1.70 travel mm

rpm : 800 2nd speed

: 4.90...5.30 travel mm

rpm : 1100 3rd speed

: 7.90...8.50 travel mm

rpm : 1150 4th speed

: 8.90...9.70 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1110 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

: 137.0...139.0 Del.quantity

1000 : (134.5...141.5)

cm3 : 4.00Spread 1000 : (7.00) RATED SPEED

1st version Control lever

position degrees: 117...125

Testing:

1st rack travel in: 11.70 Speed rpm : 1090...1100 2nd rack travel in: 4.00

Speed rpm: 1140...1170 4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 71...79

Testing:

rpm : 250 Speed Minimum rack trave: 9.50 : 350 Speed rpm

Rack travel in mm : 8.00...8.30

CONSTANT REGULATION

rpm : 350...450 Speed

START CUT-OUT

1/min: 270 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Spread

Speed rpm : 750
Del.quantity cm3/: 123.0...127.0
1000 s: (120.0...130.0)

cm3 : 5.00

1000 s: (8.00) : 1050 rpm

Del.quantity cm3/: 87.0...89.0 \*

1000 s: (84.0...92.0)

Spread cm3 : 6.001000 s: (9.00)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.70

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

\* = Set at reduced-delivery stop.

F18

Note remarks

Test sheet : MB 14,7 r 1 : 19.06.90 Edition : 12.4.90 Replaces Test oil : ISO-4113

Combination no. : 0 401 848 810

Injection pump

Pump designation : PE8P110A320LS3846-1

: 0 411 818 719 EP type number

Governor

Governor design. : RQV300...1050PA884-7 Governer no. : 0 421 813 859

Customer-spec. information

Customer : MERCEDES-BENZ

: 0M442 Engine

: 195.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. Values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50

: (4.35...4.55)

Rack travel in mm : 9.00...12.00

: 8-7-2-6-3-5-Firing order

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm: 10501st speed

Rack travel in mm : 10.90...11.00

Del.guantity cm3/: 11.1...11.3

100 s: (10.8...11.5)

cm3 : 0.8Spread

100 s: (1.3)

2nd speed rpm : 300.0 Rack travel in mm : 7.2...7.8 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.4)

cm3 : 0.6Spread

100 s: (1.1)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.00...1.40 travel mm

rpm : 480 2nd speed

: 3.10...3.60 travel mm

rpm : 770 3rd speed

: 5.60...6.10 travel mm

: 1100 4th speed rpm

: 8.70...9.20 travel mm

rpm : 1310 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1100

Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 1050 Speed : 111.0...113.0 Del.quantity 1000 : (108.5...115.5) cm3 : 8.50 1000 : (13.00) Spread RATED SPEED 1st version Control lever position degrees: 116...124 Testing: 1st rack travel in: 9.90 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1180...1210 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 85...93 Testing: : 200 Speed rom Minimum rack trave: 8.90 Speed rpm : 300 Rack travel in mm : 7.00...7.60 CONSTANT REGULATION rpm : 300...500 Speed START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version rpm : 600 Speed Del.quantity cm3/: 106.0...112.0 1000 s: (103.5...114.5) cm3 : 11.00 Spread 1000 s: (14.0) **BREAKAWAY** 1st version 1mm rack travel less than

Speed rpm : 100
Del.quantity cm3/: 130.0...150.0
1000 s: (126.0...154.0)

Remarks:

F20

Speed

full load rack tr: 9.90

STARTING FUEL DELIVERY

rpm : 1090...1100

: 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order Note remarks : STE 9,7 b : 10.08.90 Phasing : 0-60-120-180-240-300 Test sheet Edition : 0.50 (0.75) : 12.9.86 Tolerance + - ° Replaces : ISO-4113 Test oil Time to cyl. no. : 1 Combination no. : 0 401 856 701 BASIC SETTING Injection pump Pump designation : PE6P110A721RS3101 1st speed rpm: 1200 : 0 411 816 725 EP type number Rack travel in mm : 12.00...12.10 Governor Governor design. : RQV250...1200PA413 : 0 421 813 333 Del.quantity cm3/: 16.2...16.4 Governer no. 100 s: (15.9...16.7) Customer-spec. information : STFYR Customer cm3 : 0.4Spread Engine : WD615.67 100 s: (0.8) : 206.0 1st version kW 2nd speed rpm : 250.0 Rack travel in mm : 5.8...6.0 Rated speed : 2400 Del.quantity cm3/: 1.2...1.8 TEST BENCH REQUIREMENTS 100 s: (0.9...2.0) cm3 : 0.4Test oil Spread inlet temp. °C 100 s: (0.7) : 38...42 GUIDE SLEEVE POSITION Overflow valve : 1 417 413 025 Control-lever position Degree: -1 rpm : 1290 Inlet press., bar: 1.50 Speed Rack travel in mm : 15.20...17.80 Test nozzle holder : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP assembly 1st version Opening Speed rpm : 1200: 172...175 pressure, bar Aneroid pressure h: 700 : 162.0...164.0 : (159.0...167.0) Del.quantity 1000 : 1 680 750 015 Test lines : 4.00 cm3 Spread 1000 : (8.00) Outside diameter x Wall thickness : 6.00X1.50X600 RATED SPEED x Length mm 1st version (A) Injection pump setting values Insp. values in parentheses Control lever Set equal delivery quant. position degrees: 41...49 per values Testing: BEGINNING OF DELIVERY 1st rack travel in: 11.00 rpm : 1240...1250 Test pressure, bar: 25...27 2nd rack travel in: 4.00 rpm : 1335...1365 Prestroke mm : 2.80...2.90 Speed

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

4th rack travel in: 1450

Speed

rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 9...17

Testing:

Speed rpm : 100 Minimum rack trave: 7.50 rpm : 250 Speed

Rack travel in mm : 5.80...6.00 Rack travel in mm: 2.00

: 360...420 Speed rom

TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

rpm : 1200 1st speed

Rack travel in m: 12.00...12.10

: 500 2nd speed rpm

Rack travel in m: 12.50...12.60

3rd speed rpm : 880

Rack travel in m: 12.20...12.30

4th speed rpm : 1060

Rack travel in m: 12.00...12.20

Aneroid/Altitude Compensator Test

1st version

Settina

: 500 Speed rpm hPa : 700 Pressure

: 12.40...12.60 Rack travel mm

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 9.80...9.90

2nd pressure hPa : 420

Rack travel in m: 11.50...11.60

3rd pressure hPa : 330 Rack travel in m: 10.20...10.40

START CUT-OUT

1/min: 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 : 700 rpm Speed

Del.quantity cm3/: 165.0...169.0 1000 s: (163.0...171.0)

Aneroid pressure h: -

: 700 Speed rpm

Del.quantity cm3/: 120.0...125.0

1000 s: (117.0...125.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.00

rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 240.0...270.0

1000 s: (236.0...274.0)

Remarks:

F22

Note remarks

Test sheet : DAF 11,/5 57 Edition : 03.08.90

Replaces : 4.5.90 Test oil : ISO-4113

Combination no. : 0 401 876 295

Injection pump

Pump designation : PEóP120A320RS415-1 : 0 411 826 123 EP type number

Governor

: RSV250...1000P5A508-Governor design.

Governer no. : 0 421 833 194

Customer-spec. information Customer : DAF

Engine : DKZ 1160

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening .

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 20.6...20.8

100 s: (20.3...21.1)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm : 6.7...6.9 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3)

cm3 : 0.8 Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850Aneroid pressure h: 700

Del.quantity : 206.0...208.0

1000 : (203.0...211.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 45...53

Testina:

1st rack travel in: 11.50 Speed rpm : 1035...1045

2nd rack travel in: 4.00

rpm : 1115...1145 Speed

3rd rack travel in: 4.00 rpm : 1185...1215 Speed 4th rack travel in: 1350

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 19...27

Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 6.0 rpm : 250 Speed

Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00

rpm : 630...690 Speed

TORQUE CONTROL

Torque control curve - 1st version

rpm : 850 1st speed

Rack travel in m: 12.70...12.80

2nd speed rpm : 400

Rack travel in m: 12.70...12.90
3rd speed rpm : 300
Rack travel in m: 13.00...13.50

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rom hPa : 700 Pressure

: 12.50...12.60 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 10.20...10.50

2nd pressure hPa : 340 Rack travel in m: 11.80...11.90

3rd pressure hPa : 260

Rack travel in m: 10.60...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 600 Speed

Del.quantity cm3/: 140.0...142.0

1000 s: (137.0...145.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.50

rpm : 1035...1045 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 305.0...345.0

1000 s: (301.0...349.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 6.40...6.60

Note remarks

: DAF 11,6 w1 Test sheet : 08.06.90 Edition Replaces : 9.3.87 : ISO-4113 Test oil

Combination no. : 0 401 876 303

Injection pump

Pump designation : PE6P100A320RS384-1

EP type number : 0 411 806 189

Governor

Governor design. : RSV250...1100P5A510

: 0 421 837 191 Governer no.

Customer-spec. information : DAF Customer

: DK 1160V Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.20...3.30 Prestroke mm

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

: 1-5- 3- 6-Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 11.50...11.60

Del.guantity cm3/: 11.0...11.2

100 s: (10.8...11.4)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.2...7.4 Del.quantity cm3/ : 1.2...1.6

100 s: (0.9...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed

: 110.5...112.5 Del.quantity

1000 : (108.5...114.5) : 3.50 cm3

Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 46...54

Testing:

1st rack travel in: 9.80

rpm : 1125...1135 Speed

2nd rack travel in: 4.00

rpm : 1175...1205 Speed

3rd rack travel in: 4.00

rpm : 1260...1290 Speed

4th rack travel in: 1400

rpm : 0.30...1.40Speed

LOW IDLE 1 Control Lever position degrees: 17...25 Setting point w/out bumper spring rpm : 250 Speed Rack travel in mm: 6.8 Speed rpm : 250 Rack travel in mm : 7.20...7.40 Rack travel in mm : 2.00 : 700...760 Speed rpm TORQUE CONTROL Torque control curve - 1st version st speed rpm : 1050 Rack travel in m: 10.80...10.90 1st speed rpm : 600 2nd speed Rack travel in m: 11.50...1.60 rpm : 825 3rd speed Rack travel in m: 11.20...11.40 4th speed rpm : 900 Rack travel in m: 11.10...11.40 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1050Speed Del.quantity cm3/: 108.0...110.0 1000 s: (104.5...113.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.80 rpm : 1125...1135 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 195.0...235.0 1000 s: (191.0...239.0) Rack travel in mm : 19.50...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 7.20...7.40 Del.quantity cm3/: 12.0...16.0 1000 s: (9.5...18.5) cm3 : 3.50Spread 1000 s: (5.50)

F26

Note remarks

Test sheet : DAF 11,6k19 Edition : 03.08.90

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 876 311X

Injection pump

Pump designation : PE6P12OA32ORS372-1Y

EP type number : 0 411 826 125

Governor

Governor design. : RSV250...1100P5A508-

: 0 421 833 195 Governer no.

Customer-spec. information Customer

: DKX 1160 Engine

: 242.7 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

· 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.1...1.5 100 s: (0.8...1.8)

cm3 : 0.8Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed Aneroid pressure h: 700

Del.quantity : 183.5...185.5

1000 : (180.5...188.5)

Spread cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 50...58

Testina:

1st rack travel in: 10.40

rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1100...1130 Speed 3rd rack travel in: 4.00 Speed rpm : 1170...1200 4th rack travel in: 1425 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 18...26 Setting point w/out bumper spring rpm : 250 Speed Rack travel in mm: 6.0 : 250 Speed rpm Rack travel in mm : 6.40...6.60 Rack travel in mm : 2.00 : 640...700 Speed rpm TORQUE CONTROL Torque control curve - 1st version rpm : 850 1st speed Rack travel in m: 11.60...11.70 rpm : 400 2nd speed Rack travel in m: 11.60...11.80 3rd speed rpm : 300 Rack travel in m: 11.80...12.30 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm Pressure hPa : 700 : 11.40...11.50 Rack travel mm Measurement Speed 1/min: 600 1st pressure hPa : -Rack travel in m: 10.00...10.10 2nd pressure hPa : 370 Rack travel in m: 11.00...11.10 3rd pressure hPa : 300 Rack travel in m: 10.50...10.90 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/ : 135.5...137.5

1000 s: (132.5...140.5)

1st version 1mm rack travel less than

full load rack tr: 10.40 Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 315.0...355.0 1000 s: (311.0...359.0) Rack travel in mm: 19.50...21.00

LOW IDLE

Speed rpm: 250

Rack travel in mm : 6.40...6.60 Del.quantity cm3/: 11.0...15.0

1000 s: (8.0...18.0)

:

Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

F28

**BREAKAWAY** 

Note remarks

: ENA 11,9 g Test sheet Edition : 14.09.90 : 9.11.89 Replaces Test oil : ISO-4113

Combination no. : 0 401 876 333

Injection pump

Pump designation : PE6P120A320RS257 : 0 411 826 075 EP type number

Governor

Governor design. : RSV250...1100P0A533

: 0 421 833 274 Governer no.

Customer-spec. information : ENASA Customer

Engine : 96 T1AO

: 213.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 10501st speed

Rack travel in mm : 10.30...10.40

Del.quantity cm3/: 18.7...18.9

100 s: (18.4...19.2)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm : 5.9...6.1 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

: 187.0...189.0 Del.quantity 1000 : (184.0...192.0)

: 5.00 cm3

Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 85...93

Testing:

1st rack travel in: 9.30

rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1110...1140 Speed 3rd rack travel in: 4.00 Speed rpm : 1115...1145 4th rack travel in: 1300 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 60...68 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm: 5.5 Testing: : 100 Speed rpm Minimum rack trave: 19.50 Speed rpm : 250 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 : 350...410 Speed rom TORQUE CONTROL Torque control curve – 1st version st speed rpm : 1050
Rack travel in m: 10.30...10.40 1st speed rpm : 450 2nd speed Rack travel in m: 10.30...10.50 rpm : 300 3rd speed Rack travel in m: 11.50...12.20 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.30 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0) Rack travel in mm : 19.50...21.00 Remarks:

APPLICATION

Navy

Note remarks

Test sheet : DAF 11,7 f : 08.06.90 Edition : 30.3.90 Replaces Test oil : ISO-4113

Combination no. : 0 401 876 335

Injection pump

Pump designation : PE6P120A320RS415-1 : 0 411 826 123 EP type number

Governor

: RSV250...1100P5A508-Governor design.

: 0 421 833 298 Governer no.

Customer-spec. information : DAF Customer

: DKV 1160 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.80...2.90 : (2.75...2.95) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 650

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 17.1...17.3

100 s: (16.8...17.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm: 6.7...6.9 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3)

cm3 : 0.8Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650 Aneroid pressure h: 700

: 171.0...173.0 Del.quantity

1000 : (168.0...176.0)

: 5.00 cm3 Spread 1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 95...103

Testina:

1st rack travel in: 9.10

rpm : 1135...1145 Speed

2nd rack travel in: 4.00

rpm : 1175...1205 Speed

Prestroke mm

3rd rack travel in: 4.00 rpm : 1200...1230 Speed 4th rack travel in: 1375 rpm : 0.30...1.40Speed LOW IDLE 1 Control Lever position degrees: 66...74 Setting point w/out bumper spring : 250 rpm Speed Rack travel in mm : 5.8 Speed rom Rack travel in mm : 6.20...6.40 Rack travel in mm : 2.00 : 630...730 Speed rom TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1090 Rack travel in m: 10.10...10.20 2nd speed : 650 rom Rack travel in m: 11.40...11.50 3rd speed rpm : 800 Rack travel in m: 10.80...11.00 4th speed rpm : 850 Rack travel in m: 10.40...10.70 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed mar hPa : 700 Pressure : 11.10...11.20 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : -Rack travel in m: 9.50...9.70 2nd pressure hPa : 290 Rack travel in m: 10.70...10.90 3rd pressure hPa : 260 Rack travel in m: 10.20...10.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 Speed : 1090 rpm Del.quantity cm3/: 159.0...161.0 1000 s: (155.0...165.0) Aneroid pressure h: -

**BREAKAWAY** 1st version Speed Speed LOW IDLE Speed rpm Remarks:

G04

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: DAF 11,7 g Test sheet : 08.06.90 Edition : 16.2.90 Replaces : ISO-4113 Test oil

Combination no. : 0 401 876 336

Injection pump

Pump designation : PE6P120A320RS415-1 : 0 411 826 123 EP type number

Governor

Governor design. : RSV250...1050P5A539

: 0 421 833 299 Governer no.

Customer-spec. information Customer : DAF

: KT 191 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

BASIC SETTING

1st speed rpm : 650

Rack travel in mm : 10.80...10.90

Del.quantity cm3/: 16.1...16.3

100 s: (15.8...16.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm: 6.4...6.8 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3)

cm3 : 0.8 100 s: (1.2) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 650 Speed Aneroid pressure h: 700

: 161.0...163.0 Del.quantity 1000 : (158.0...166.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 96...104

Testina:

1st rack travel in: 9.20

rpm : 1085...1095 Speed

2nd rack travel in: 4.00

rpm : 1125...1155 Speed

3rd rack travel in: 4.00

Speed rpm : 1150...1180 4th rack travel in: 1320 Speed rpm : 0.30...1.40

LOW IDLE 1 Control Lever

position degrees: 70...78 Setting point w/out bumper spring

: 250 Speed rpm Rack travel in mm : 5.8 Speed rpm : 250

Rack travel in mm : 6.20...6.40

Rack travel in mm : 2.00 : 630...730 Speed rom

TORQUE CONTROL

Torque control curve - 1st version

1st speed

st speed rpm : 1040 Rack travel in m: 10.20...10.30

rpm : 650 2nd speed

Rack travel in m: 11.10...11.20

rpm : 805 3rd speed

Rack travel in m: 10.80...11.00

4th speed rpm : 850

Rack travel in m: 10,50...10.70

Aneroid/Altitude Compensator Test

1st version Setting

: 600 Speed rom hPa : 700 Pressure

: 10.80...10.90 Rack travel mm

Measurement

 $1/\min : 600$ Speed

1st pressure hPa : -

Rack travel in m: 9.50...9.70
2nd pressure hPa : 310
Rack travel in m: 10.40...10.50
3rd pressure hPa : 250

Rack travel in m: 9.80...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 rpm : 1040 Speed

Del.quantity cm3/: 161.0...163.0 1000 s: (157.0...167.0)

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 130.0...132.0 1000 s: (127.0...135.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.20

rpm : 1085...1095 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 300.0...340.0 1000 s: (296.0...344.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 6.20...6.40

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : DAF 11,7 f1 Test sheet : 08.06.90 Edition : 16.2.90 Replaces : ISO-4113 Test oil Combination no. : 0 401 876 338 Injection pump Pump designation : PE6P120A320RS415-1 EP type number : 0 411 826 123 Governor Governor design. : RSV250...1100P5A508-: 0 421 833 321 Governer no.

Customer-spec. information Customer : DAF

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

: KS 238

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

Engine

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasina

: 0.50 (0.75) Tolerance + - °

BASIC SETTING

1st speed rpm: 650

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 18.8...19.0

100 s: (18.5...19.3)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.02nd speed Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6)

cm3 : 0.8 Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 650 Aneroid pressure h: 700

Del.quantity : 788.0....93.0)

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 99...107

Testing:

1st rack travel in: 10.00

Speed rpm : 1130...1140

2nd rack travel in: 4.00

rpm : 1185...1215 Speed

3rd rack travel in: 4.00 rpm : 1225...1255 Speed 4th rack travel in: 1400 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 70...78 Setting point wout bumper spring : 250 rpm Rack travel in mm: 6.0 : 250 Speed rpm Rack travel in mm : 6.40...6.60 Rack travel in mm : 2.00 rpm : 600...700 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1090 1st speed Rack travel in m: 11.00...11.10 rpm : 650 2nd speed Rack travel in m: 12.20...12.30 d speed rpm : 760 3rd speed Rack travel in m: 11.60...11.80 : 810 4th speed rpm Rack travel in m: 11.20...11.40 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 700 Pressure Rack travel mm : 11.90...12.00 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 9.70...9.90 2nd pressure hPa : 300 Rack travel in m: 11.30...11.40 3rd pressure hPa : 230 Rack travel in m: 10.40...10.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 1090 Speed rpm Del.quantity cm3/: 181.0...183.0 1000 s: (177.0...187.0) Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 131.0...133.0 1000 s: (128.0...136.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.00 rpm : 1130...1140 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed Del.quantity cm3/: 305.0...345.0

1000 s: (301.0...349.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 6.40...6.60

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : DAF 11,7 f2 Test sheet : 21.09.90 Edition Replaces Test oil : ISO-4113 Combination no. : 0 401 876 341 Injection pump Pump designation : PE6P12OA32ORS415-1 : D 411 826 123 EP type number Governor Governor design. : RSV250...1100P5A508-10 : 0 421 833 342 Governer no. Customer-spec. information Customer : DAF : KS 238 G Engine TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test Lines : 1 680 750 067 Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) BASIC SETTING rpm : 650 1st speed Rack travel in mm : 12.10...12.20 Del.guantity cm3/: 19.1...19.3 100 s: (18.8...19.6) Spread cm3 : 0.5100 s: (0.9) rpm : 250.0 2nd speed Rack travel in mm: 7.2...7.6 Del.quantity cm3/: 3.6...4.2 100 s: (3.3...4.5) cm3 : 0.8Spread 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -3 Speed rpm: 800 Rack travel in mm: 0.30...0.70 Governor spring pre-tension Click setting x : 4.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 650 Speed Aneroid pressure h: 700 Del.quantity : 191.0...193.0 1000 : (188.0...196.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 99...107 Testing: 1st rack travel in: 10.20 rpm : 1125...1135 Speed 2nd rack travel in: 4.00

rpm : 1170...1200

Speed

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

: 2.80...2.90

: (2.75...2.95)

3rd rack travel in: 4.00 Speed rpm : 1240...1270 4th rack travel in: 1500 Speed rpm : 0.30...1.40LOW IDLE 1 Control Lever position degrees: 69...77 Setting point w/out bumper spring : 250 Speed rpm Rack travel in mm: 7.0 Speed rpm Rack travel in mm : 6.90...7.10 Rack travel in mm : 2.00 : 640...740 Speed rom TORQUE CONTROL Torque control curve - 1st version st speed rpm : 1090 Rack travel in m: 11.20...11.40 1st speed : 650 2nd speed rpm Rack travel in m: 12.30...12.40 rpm : 690 3rd speed Rack travel in m: 12.10...12.20 rpm : 760 4th speed Rack travel in m: 11.50...11.70 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 700 Pressure : 12.10...12.20 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 9.60...9.90 2nd pressure hPa : 340 Rack travel in m: 11.40...11.50 3rd pressure hPa : 210 Rack travel in m: 10.30...10.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 rpm : 1090 Speed Del.quantity cm3/: 185.0...187.0 1000 s: (181.0...191.0) Aneroid pressure h: -: 600 Speed rpm Del.quantity cm3/: 128.5...130.5 1000 s: (125.5...133.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.20

rpm : 1125...1135 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 295.0...335.0 1000 s: (291.0...339.0) Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm

Rack travel in mm : 7.20...7.60 Del.quantity cm3/ : 36.0...42.0 1000 s: (33.0...45.0)

cm3 : 8.00

Spread 1000 s: (12.00)

Note remarks

: ENA 11,9 i Test sheet : 14.09.90 Edition : 13.12.89 Replaces : ISO-4113 Test oil

Combination no. : 0 401 876 760

Injection pump

Pump designation : PE6P12OA32ORS3176-1

EP type number : 0 411 826 767

Governor

Governor design. : RSV250...1100P0A533

: 0 421 833 274 Governer no.

Customer-spec. information Customer : FNASA

: 96 W1 A0 Engine

: 250.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.80...3.90 Prestroke mm

: (3.75...3.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 24.6...24.8

100 s: (24.3...25.1)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.02nd speed Rack travel in mm: 4.1...4.3 Del.quantity cm3/: 2.5...3.1 100 s: (2.2...3.4) Spread cm3: 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 246.0...248.0 Del.quantity 1000 : (243.0...251.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 91...99

Testing:

1st rack travel in: 12.60

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm : 1200...1230 3rd rack travel in: 4.00

rpm : 1200...1230 Speed

4th rack travel in: 1350

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 65...73

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm : 5.5

Testing:

rpm : 100 Speed

Minimum rack trave: 19.50

Speed rpm: 250
Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: 340...400

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 13.60...13.70

rpm : 450 2nd speed

Rack travel in m: 13.60...13.80

3rd speed rpm : 300

Rack travel in m: 14.80...15.40

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 12.60

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

rpm\_ : 100 Speed

Del.quantity cm3/: 150.0...170.0

1000 s: (146.0...174.0)

Rack travel in mm: 19.50...21.00

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : ENA 12,9 b : 14.09.90 Test sheet Edition : 1.12.89 Replaces : ISO-4113 Test oil Combination no. : 0 401 876 771 Injection pump Pump designation: PE6P12OA32ORS3244 EP type number : 0 411 826 788 Governor Governor design. : RSV250...1000P0A545 : 0 421 833 329 Governer no. Customer-spec. information : ENASA Customer Engine : 98 W1AO.MR4 : 309.0 1st version kW : 2000 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening | pressure, bar : 207...210 Orifice plate diameter mm : 0,8 : 1 680 750 067 Test lines Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm

Spread Spread Speed Speed Spread (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_ BEGINNING OF DELIVERY Test pressure, bar: 25...27 Testing:

Prestroke mm : 3.30...3.40 : (3.25...3.45) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm : 1000Rack travel in mm : 12.60...12.70 Del.quantity cm3/: 26.0...26.2 100 s: (25.7...26.5) cm3 : 0.5100 s: (0.9) 2nd speed rpm : 250.0
Rack travel in mm : 3.6...3.8
Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) cm3 : 0.8 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : 2.75FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1000Aneroid pressure h: 1500 : 260.0...262.0 Del.quantity 1000 : (257.0...265.0) cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 84...92

1st rack travel in: 11.60

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

rpm : 1070...1100 Speed

3rd rack travel in: 4.00

Speed rpm : 1070...1100 4th rack travel in: 1250

rpm : 0.30...1.40Speed

LOW IDLE 1

Control lever

position degrees: 61...69

Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 3.2

Testing:

Speed rpm : 100 Minimum rack trave: 19.50 : 250 Speed rpm

Rack travel in mm : 3.60...3.80

Rack travel in mm : 2.00

rpm : 270...330 Speed

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1000 1st speed

Rack travel in m: 12.80...13.00

rpm : 450 2nd speed

Rack travel in m: 12.90...13.10

3rd speed rpm : 300

Rack travel in m: 14.10...14.70

Aneroid/Altitude Compensator Test

1st version

Setting

Speed MCI : 500 hPa : 1500 Pressure

: 12.60...12.70 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 8.50...8.90

2nd pressure hPa : 970

Rack travel in m: 11.60...11.70 3rd pressure hPa : 510

Rack travel in m: 9.50...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 141.5...143.5 1000 s: (138.5...146.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 1040...1050

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 150.0...170.0 1000 s: (146.0...174.0)

Rack travel in mm : 19.50...21.00

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

APPLICATION

Navy

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : ENA 11,9 j : 14.09.90 Edition : 9.11.89 Replaces : ISO-4113 Test oil

Combination no. : 0 401 876 772

Injection pump

Pump designation : PE6P120A320RS3200 : 0 411 826 766 EP type number

Governor

: RSV250...1000P0A545-Governor design.

: 0 421 833 330 Governer no.

Customer-spec. information : ENASA Customer

: 96 T1EO.MR4 Engine

: 250.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 3.80...3.90 : (3.75...3.95) Prestroke mm

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4

Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 23.6...23.8

100 s: (23.3...24.1)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed

Rack travel in mm : 3.3...3.7 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1200

: 236.0...238.0 Del.quantity

1000 : (233.0...241.0) cm3 : 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 81...89

Testing: 1st rack travel in: 10.60 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1070...1100 Speed 3rd rack travel in: 4.00 Speed rpm : 1070...1100 4th rack travel in: 1250 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 59...67 Setting point w/out bumper spring rpm : 250° Speed Rack travel in mm: 5.5 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 250 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 rpm : 340...400 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 11.80...12.00 rpm : 450 2nd speed Rack travel in m: 11.90...12.10 3rd speed rpm : 300 Rack travel in m: 13.00...13.60 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rom hPa : 1200 Pressure Rack travel mm : 11.60...11.70 Measurement 1/min: 500 Speed

1st pressure hPa : -Rack travel in m: 8.20...8.60 2nd pressure hPa : 790 Rack travel in m: 10.90...11.00 3rd pressure hPa : 540 Rack travel in m: 9.30...9.50

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 133.5...135.5 1000 s: (130.5...138.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.60 rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

rpm : 100 Del.quantity cm3/: 150.0...180.0 1000 s: (146.0...184.0)

Rack travel in mm : 19.50...21.00

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

**APPLICATION** 

Navy

G16

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 11,0 z : 17.09.90 Edition Replaces : ISO-4113 Test oil Combination no. : 0 401 876 775 Injection pump Pump designation : PE6P110A320LS3835-3 : 0 411 816 773 EP type number Governor Governor design. : RSV350...1050P0A531-: 0 421 833 343 Governer no. Customer-spec. information : MERCEDES-BENZ Customer Engine : OM 441 : 160.0 1st version kW : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 0 681 343 009 assembly Openina pressure, bar : 172...175

Test lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY

Test pressure, bar: 25...27 G17

: 4.00...4.10 Prestroke mm : (3.95...4.15) Rack travel in mm : 9.00...12.00 : 6-3-5-2-4-1 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 6 BASIC SETTING 1st speed rpm : 1030Rack travel in mm: 14.30...14.40 Del.quantity cm3/: 13.8...14.0 100 s: (13.5...14.2) cm3 : 0.4Spread 100 s: (0.8) rpm : 350.0 2nd speed Rack travel in mm : 9.2...9.6 Del.quantity cm3/ : 1.2...1.8 100 s: (0.9...2.0) cm3 : 0.4Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x :? FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1030 : 138.0...140.0 Speed Del.quantity 1000 : (135.5...142.5) Spread cm3 : 4.00 1000 : (8.00) RATED SPEED

1st version Control lever

position degrees: 88...96

Testing:

1st rack travel in: 13.40 Speed rpm : 1070...1080 2nd rack travel in: 4.00 rpm : 1130...1160 Speed 4th rack travel in: 1300 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 64...72 Setting point w/out bumper spring : 350 rpm Rack travel in mm: 9.4 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 350 Speed Rack travel in mm : 9.20...9.60 Rack travel in mm : 2.00 rpm : 380...440 Speed SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 750 Del.quantity cm3/: 126.0...130.0 1000 s: (123.0...133.0) cm3 : 6.00Spread 1000 s: (8.) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.40 rpm : 1070...1080 Speed STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0) Remarks: Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 s 1 Edition : 06.07.90

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 878 715

Injection pump

Pump designation : PE8P110A320LS3842-2

EP type number : 0 411 818 722

Governor

Governor design. : RSV350...1050P0A824-

13

Governer no. : 0 421 833 341

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M442

1st version kW : 213.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

X Wall Linckness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10 : (3.95...4.15)

Rack travel in mm : 9.00...12.00

Firing order : 8-7-2-6-3-5-

Phasing : 0-45-90-135-180-225-

Phasing : 270–315

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 1030

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 13.7...13.9

100 s: (13.4...14.1)

Spread cm3: 0.4

100 s: (0.8)

2nd speed rpm : 350.0 Rack travel in mm : 8.1...8.7

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.4)

Spread cm3 : 0.4 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800 Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1030

Del.quantity : 137.0...139.0 1000 : (134.5...141.5)

Spread cm3 : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 91...99

Testing: 1st rack travel in: 11.90 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 4th rack travel in: 1400 rpm : 0.30...1.70Speed LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper spring rpm : 350 Rack travel in mm: 8.4 Testina: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 350 Speed Rack travel in mm : 8.30...8.50 Rack travel in mm : 2.00 rpm : 410...470 Speed SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 750 Speed Del.quantity cm3/: 124.0...128.0 1000 s: (121.0...131.0) Spread cm3 : 6.001000 s: (9.00) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.90 rpm : 1090...1100 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0) Remarks:

G20

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 3.50...3.60 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 5- 4- 2 Note remarks : MAN 10,0 a1 Test sheet : 31.07.90 Edition Replaces Test oil : ISO-4113 : 0-72-144-216-288 Phasing Combination no. : 0 402 035 022 Tolerance + - ° : 0.50 (0.75)Time to cyl. no. : 5 Injection pump Pump designation : PES5P120A720/3LS512 EP type number : 0 412 025 021 BASIC SETTING Governor rpm: 750 Governor design. : RQ300/1000PA813-14 1st speed : 0 421 801 530 Governer no. Rack travel in mm : 10.70...10.80 Customer-spec. information Del.quantity cm3/: 20.5...20.7 Customer : MAN 100 s: (20.2...21.0) : D2865LF02 Engine cm3 : 0.51st version kW : 199.0 Spread Rated speed : 2000 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 300.02nd speed Rack travel in mm: 4.2...4.6 Test oil Del.quantity cm3/: 1.7...2.3 inlet temp. °C : 38...42 100 s: (1.4...2.6) cm3 : 0.8 Overflow valve Spread 100 s: (1.2) : 1 417 413 025 GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Degree: -2 Test nozzle holder : 1 688 901 019 rpm : 600 Speed assembly Rack travel in mm : 19.20...20.80 Opening : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP pressure, bar 1st version Orifice plate Speed rpm : 750 diameter mm : 0,8 Aneroid pressure h: 1000 Del.quantity : 205.0...207.0 1000 : (202.0...210.0) Test lines : 1 680 750 067 : 5.00 Spread cm3 Outside diameter 1000 : (9.00) x Wall thickness : 6.00x1.50x1000 RATED SPEED x Length mm (A) Injection pump setting values 1st version Insp. values in parentheses Setting point: Set equal delivery quant. : 600 per values Speed rpm

Rack travel in mm: 20.0

1st rack travel in: 9.50

Testina:

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

rpm : 1045...1060 Speed 2nd rack travel in: 4.00 rpm : 1100...1130 Speed 4th rack travel in: 1250 rom : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 4.4 Testing: Speed : 100 rpm Minimum rack trave: 5.90 : 300 rpm Rack travel in mm : 4.30...4.50 Rack travel in mm: 2.00 : 335...375 Speed rom TORQUE CONTROL Dimension a mm : 0.20 Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 10.50...10.60 rpm : 750 2nd speed Rack travel in m: 10.90...11.10 rpm : 850 3rd speed Rack travel in m: 10.70...10.90 Aneroid/Altitude Compensator Test 1st version Setting rpm Speed : 500 hPa : 1000 Pressure Rack travel mm : 10.70...10.80 Measurement Speed  $1/\min : 500$ 1st pressure hPa : -Rack travel in m: 8.30...8.50

2nd pressure hPa : 100 Rack travel in m: 8.70...8.80

3rd pressure hPa : 350

Rack travel in m: 10.40...10.60 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version

Aneroid pressure h: 1000 Speed rpm : 1000

Del.quantity cm3/: 200.0...204.0 1000 s: (197.0...207.0) Aneroid pressure h: 1000 rpm : 650 Speed Del.quantity cm3/: 197.0...203.0 1000 s: (194.0...206.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 134.0...136.0 1000 s: (131.0...139.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.50 rpm : 1045...1060 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 190.0...210.0 1000 s: (186.0...214.0) LOW IDLE

Speed rpm : 300 Rack travel in mm : 4.20...4.60 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0)

cm3 : 8.00 Spread 1000 s: (12.00)

Remarks: : MAN-NR. 3-7043 Setting and blocking of pointer of start-of-delivery sensor on cyl. 5 start of delivery

: 3.50...3.60 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.45...3.65) Rack travel in mm : 9.00...12.00 Note remarks : 1-3-5-4-2 Firing order Test sheet : MAN 10,0 a2 : 21.09.90 Edition Replaces : ISO-4113 : 0-72-144-216-288 Test oil Phasing : 0 402 035 023 Tolerance + - ° : 0.50 (0.75) Combination no. Time to cyl. no. : 5 Injection pump Pump designation : PES5P120A720/3LS512 EP type number : 0 412 025 021 BASIC SETTING Governor Governor design. : RQ300/950PA813-15 1st speed rpm: 750 : 0 421 801 532 Governer no. Rack travel in mm : 11.70...11.80 Customer-spec. information Del.guantity cm3/: 21.9...22.1 Customer : MAN 100 s: (21.6...22.4) Engine : D2865LF0/LU/01 : 198.0 cm3 : 0.5Spread 1st version kW : 1900 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 300.0 2nd speed Rack travel in mm: 4.6...4.8 Test oil Del.quantity cm3/: 1.7...2.3 inlet temp. °C : 38...42 100 s: (1.4...2.6) Overflow valve Spread cm3 : 0.8100 s: (1.2) : 1 417 413 025 GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Degree: -2 Test nozzle holder : 1 688 901 019 rpm : 600 Speed assembly Rack travel in mm : 19.20...20.80 Openina ( FULL LOAD DELIV. AT FULL LOAD STOP : 207...210 pressure, bar 1st version Orifice plate Speed diameter mm : 0,8 rom : 750 Aneroid pressure h: 1000 : 219.0...221.0 Del.quantity 1000 Test lines : 1 680 750 067 : (216.0...224.0) cm3 : 5.00 Spread 1000 : (9.00) Outside diemeter x Wall thickness x Length mm : 6.00x1.50x1000 RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set equal delivery quant. Setting point: per values Speed rpm : 600 Rack travel in mm: 20.0 BEGINNING OF DELIVERY Test pressure, bar: 30...32 Testina:

1st rack travel in: 10.60

rpm : 995...1010 Speed 2nd rack travel in: 4.00 : 1030...1060 Speed COM 4th rack travel in: 1200 rpm : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack trayel in mm: 4.7 Testina: Speed rpm : 100 Minimum rack trave: 6.20 rpm : 300 Rack travel in mm : 4.60...4.80 Rack travel in mm : 2.00 rpm : 350...390 Speed TORQUE CONTROL Dimension a mm : 0.20 Torque control curve - 1st version 1st speed rpm : 950 Rack travel in m: 11.60...11.70 d speed rpm : 750 2nd speed Rack travel in m: 12.10...12.30 3rd speed rpm : 825 Rack travel in m: 11.90...12.10 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 500 hPa : 1000 Pressure Rack travel mm : 11.70...11.80 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 8.40...8.60 2nd pressure hPa : 110 Rack travel in m: 8.80...8.90 3rd pressure hPa : 450 Rack travel in m: 11.00...11.20 START CUT-OUT 1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

rpm : 950

Aneroid pressure h: 1000

Del.quantity cm3/: 216.0...220.0 1000 s: (213.0...223.0) Aneroid pressure h: 1000 Speed rpm : 600 Del.quantity cm3/: 210.0...216.0 1000 s: (207.0...219.0) Ameroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 128.0...130.0 1000 s: (125.0...133.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.60 rpm : 995...1010 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 190.0...210.0 1000 s: (186.0...214.0) LOW IDLE rpm : 300 Speed Rack travel in mm : 4.60...4.80 Del.quantity cm3/ : 17.0...23.0 1000 s: (14.0...26.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: : MAN-NR. 3-7044 Setting and blocking of pointer of start-of-delivery sensor on cyl. 5 start of delivery

Speed

1st version

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MAN 10,0 b1 Test sheet : 21.09.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 035 024

Injection pump

Pump designation : PESSP120A720/3LS512

: 0 412 025 021 EP type number

Governor

Governor design. : RQV300...1000PA876-5

: 0 421 813 865 Governer no.

Customer-spec. information Customer : MAN

: D2865LF02 Engine

: 199.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening.

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 Prestroke mm

: (3.45...3.65) Rack travel in mm : 9.00...12.00

Firing order : 1-3-5-4-2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

: 5 Time to cyl. no.

BASIC SETTING

rpm: 750 1st speed

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 20.5...20.7

100 s: (20.2...21.0)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm: 4.3...4.5

Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6)

cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL rpm : 1045 1st speed

: 9.90...10.10 travel mm

rpm : 300 2nd speed

: 1.60...1.80 travel mm

rpm : 500 3rd speed

travel mm : 3.40...3.90

rpm : 800 4th speed

: 6.80...7.20 travel mm

rpm : 1250 5th speed

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1100 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 750 Speed Aneroid pressure h: 1000

: 205.0...207.0 Del.quantity 1000 : (202.0...210.0) : 5.00 cm3Spread 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 296...304 Testing: 1st rack travel in: 9.50 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1090...1120 Speed 4th rack travel in: 1250 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 254...262 Testing: Speed rpm : 100 Minimum rack trave: 5.90 Speed rpm : 300 Rack travel in mm : 4.30...4.50 CONSTANT REGULATION rpm : 280...400Speed TORQUE CONTROL Dimension a mm : 0.20 Torque control curve - 1st version rpm : 750 1st speed Rack travel in m: 10.70...10.80 2nd speed rpm : 1000 Rack travel in m: 10.50...10.60 3rd speed rpm : 900 Rack travel in m: 10.50...10.60 Aneroid/Altitude Compensator Test 1st version Settina : 500 Speed rom hPa : 1000 Pressure : 10.70...10.80 Rack travel mm Measurement  $1/\min : 500$ Speed

Rack travel in m: 10.40...10.60 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 1000 Del.quantity cm3/ : 200.0...204.0 1000 s: (197.0...207.0) Aneroid pressure h: 1000 : 650 Speed rom Del.quantity cm3/: 197.0...203.0 1000 s: (194.0...206.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 134.0...136.0 1000 s: (131.0...139.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.50 rpm : 1040...1050 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 190.0...210.0 1000 s: (186.0...214.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 4.30...4.50 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) cm3 : 8.00Spread 1000 s: (12.00) Remarks: : MAN-NR. 7045 Setting and blocking of pointer of start-of-delivery sensor on cyl. 5 start of delivery

1st pressure hPa : -

2nd pressure hPa : 100

3rd pressure hPa : 350

Rack travel in m: 8.30...8.50

Rack travel in m: 8.70...8.80

: 3.50...3.60 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.45...3.65) Rack travel in mm : 9.00...12.00 Note remarks : 1-3-5-4-2 Firing order : MAN 10,0 b2 Test sheet : 31.07.90 Edition Replaces : 0-72-144-216-288 : ISO-4113 Phasing Test oil Tolerance + - ° : 0.50 (0.75) : 0 402 035 025 Combination no. Injection pump Time to cyl. no. : 5 Pump designation : PES5P120A720/3LS512 : 0 412 025 021 BASIC SETTING EP type number Governor Governor design. : RQV300...950PA876-8 rpm: 750 1st speed : 0 421 813 868 Governer no. Rack travel in mm : 11.20...11.30 Customer-spec. information Del quantity cm3/: 21.9...22.1 : MAN Customer : D2865LF0/LU/01 100 s: (21.6...22.4) Engine 1st version kW : 198.0 Spread cm3 : 0.5Rated speed : 1900 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 300.0 2nd speed Rack travel in mm: 3.9...4.1 Test oil Del.quantity cm3/: 1.7...2.3 inlet temp. °C : 38...42 100 s: (1.4...2.6) Overflow valve Spread cm3 : 0.8100 s: (1.2) : 1 417 413 025 Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 019 GUIDE SLEEVE TRAVEL assembly rpm : 995 1st speed : 9.70...9.90 travel mm **Opening** rpm : 300 : 207...210 2nd speed pressure, bar 1.00...1.20 travel mm 500 3rd speed Orifice plate rpm : : 3.40...4.00 rpm : 750 diameter mm : 0,8 travel mm 4th speed : 6.60...7.00 travel mm : 1 680 750 067 5th speed rpm : 1250 Test lines : 13.00...14.00 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00x1.50x1000 Control-lever position x Length mm Degree: -1 rpm : 1020 (A) Injection pump setting values Speed Rack travel in mm : 15.20...17.80 Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values 1st version BEGINNING OF DELIVERY Test pressure, bar: 30...32 Speed rpm : 750

Aneroid pressure h: 1000

Del.quantity : 219.0...224.0) : 5.00 Spread cm31000 : (9.00)RATED SPEED 1st version Control lever position degrees: 296...304 Testina: 1st rack travel in: 10.10 rpm : 990...1000 Speed 2nd rack travel in: 4.00 rpm : 1030...1060 Speed 4th rack travel in: 1200 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 253...261 Testing: Speed rpm : 100 Minimum rack trave: 5.50 rpm : 300 Rack travel in mm : 3.90...4.10 CONSTANT REGULATION rpm : 320...440 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 950 1st speed Rack travel in m: 11.10...11.30 2nd speed rpm : 750 Rack travel in m: 11.20...11.30 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 1000 Pressure

Rack travel mm : 11.20...11.30

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 7.90...8.10

2nd pressure hPa : 110

Rack travel in m: 8.30...8.40

3rd pressure hPa : 450

Rack travel in m: 10.20...10.40

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 950 Del.quantity cm3/ : 216.0...220.0 1000 s: (213.0...223.0)

Aneroid pressure h: 1000 : 600 rpm

Del.quantity cm3/: 210.0...216.0 1000 s: (207.0...219.0)

Aneroid pressure h:

Speed rpm : 500 Del.quantity cm3/: 128.0...130.0

1000 s: (125.0...133.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.10

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 190.0...210.0

1000 s: (186.0...214.0)

LOW IDLE

rpm : 300Speed

Rack travel in mm : 3.90...4.10 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0)

: 8.00 cm3 Spread

1000 s: (12.00)

Remarks:

: MAN-NR. 7046

Setting and blocking of pointer of start-of-delivery sensor on cyl. 5

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 11,9a21 : 29.06.90 Edition : 2.10.89 Replaces : ISO-4113 Test oil : 0 402 036 057 Combination no. Injection pump : PES6P120A720/3LS470-Pump designation EP type number : 0 412 026 050 Governor Governor design. : RQV300.. 1100PA700-1 : 0 421 813 528 Governer no.

Customer-spec. information Customer : MAN : D2866LF Engine

: 243.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00 : 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cvl. no. : 6

BASIC SETTING

rpm: 750 1st speed

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 20.2...20.4

100 s: (19.9...20.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm: 4.7...5.1 Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.1)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed : 1.40...1.60 travel mm

rpm : 850 2nd speed

: 5.60...5.90 travel mm

rpm : 1100 3rd speed

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 750 Speed Aneroid pressure h: 1000

Del.quantity : 202.0...204.0 1000 : (199.0...207.0)

: 5.00 Rack travel in m: 10.80...11.20 cm3 Spread 1000 : (9.00) START CUT-OUT RATED SPEED 1/min: 220 (240) Speed 1st version FUEL DELIVERY CHARACTERISTICS Control Lever position degrees: 114...122 1st version Testina: Aneroid pressure h: 1000 1st rack travel in: 9.90 rpm : 1140...1150 : 1100 Speed Speed rpm Del.quantity cm3/: 206.0...208.0 1000 s: (203.0...211.0) 2nd rack travel in: 4.00 rpm : 1220...1250 Speed Aneroid pressure h: 1000 4th rack travel in: 1350 Speed rpm : 650 Del.quantity cm3/ : 203.0...209.0 1000 s: (200.0...212.0) rpm : 0.00...1.00Speed LOW IDLE 1 Aneroid pressure h: 280 Control lever : 500 position degrees: 80...88 Speed rpm Del.quantity cm3/: 184.0...196.0 1000 s: (181.0...199.0) Testing: Aneroid pressure h: -Speed rpm : 100 Speed rpm : 500 Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) Minimum rack trave: 6.40 rpm : 300 Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 310...410 **BREAKAWAY** Speed 1st version TORQUE CONTROL 1mm rack travel less than Dimension a mm : 0.80 Torque control curve - 1st version rpm : 750 full load rack tr: 9.90 1st speed rpm : 1140...1150 Rack travel in m: 11.30...11.40 Speed rpm : 1100 2nd speed STARTING FUEL DELIVERY Rack travel in m: 10.90...11.10 3rd speed rpm : 850 Rack travel in m: 11.30...11.50 4th speed rpm : 975 Speed : 100 rpm Del.quantity cm3/: 225.0...245.0 Rack travel in m: 11.00...11.30 1000 s: (221.0...249.0) Aneroid/Altitude LOW IDLE Compensator Test rpm : 300 Speed Rack travel in mm : 4.70...5.10 1st version De(.quantity cm3/: 12.0...18.0 1000 s: (9.0...21.0) Setting : 500 Speed rpm cm3 : 8.00hPa : 1000 Spread Pressure 1000 s: (12.00) Rack travel mm : 11.30...11.40 Remarks: Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 9.20...9.40 2nd pressure hPa : 85 Rack travel in m: 9.60...9.70 3rd pressure hPa : 280

H<sub>0</sub>2

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAN 11,9a38 Test sheet : 29.06.90 : 15.12.89 Edition Replaces : ISO-4113 Test oil Combination no. : 0 402 036 078 Injection pump Pump designation : PES6P120A720/3LS470-: 0 412 026 050 EP type number Governor Governor design. : RQ300/11/10PA813-8 : 0 421 801 483 Governer no. Customer-spec. information Customer : MAN : D2866LF/290 Engine : 213.0 1st version kW : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Openina : 207...210 pressure, bar

Orifice plate : 0,8 diameter mm Test lines : 1 680 750 067 Outside diameter x Wall thickness : 6.00X1.50X1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_ BEGINNING OF DELIVERY

: 2.80...2.90 : (2.75...2.95) Prestroke mm Rack travel in mm : 9.00...12.00 : 6-2-4-1-5-3 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 6 BASIC SETTING rom: 1100 1st speed Rack travel in mm : 9.80...9.90 Del.quantity cm3/: 18.4...18.6 100 s: (18.1...18.9) cm3 : 0.5Spread 100 s: (0.9) rpm : 300.02nd speed Rack travel in mm: 4.6...5.0 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.1) cm3 : 0.8Spread 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600Speed Rack travel in mm : 14.70...16.30 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 Aneroid pressure h: 1000 : 184.0...186.0 Del.quantity 1000 : (181.0...189.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Setting point: rpm : 600 Rack travel in mm: 15.5

Testing:

Test pressure, bar: 30...32

1st rack travel in: 8.80 rpm : 1145...1160 Speed 2nd rack travel in: 4.00 rpm : 1180...1210 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.00 LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 4.8 Testing: rpm : 100 Speed Minimum rack trave: 6.30 : 300 Speed rom Rack travel in mm : 4.70...4 90 Rack travel in mm : 2.00 : 380...420 Speed rom TORQUE CONTROL Dimension a mm : 0.35 Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 9.80...9.90 2nd speed rpm : 750 Rack travel in m: 10.60...10.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rom hPa : 1000 Pressure : 10.10...10.30 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 8.80...9.00 2nd pressure hPa : 85 Rack travel in m: 9.10...9.20 3rd pressure hPa : 160 Rack travel in m: 9.80...10.00 START CUT-OUT 1/min: 190 (210) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000

rpm : 750

1000 s: (182.0...191.0)

Del.quantity cm3/: 185.0...188.0

Aneroid pressure h: 1000

Speed rpm : 650

Del.quantity cm3/: 174.0...180.0

1000 s: (171.0...183.0)

Aneroid pressure h: 160

Speed rpm : 500

Del.quantity cm3/: 157.0...169.0

1000 s: (154.0...172.0)

Aneroid pressure h: 
Speed rpm : 500

Del.quantity cm3/: 132.0...134.0

1000 s: (129.0...137.0)

## BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 8.80 Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 225.0...245.0 1000 s: (221.0...249.0)

## LOW IDLE

Remarks:

: MAN-NR. 2-7760

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 start of delivery

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.80...2.90 : (2.75...2.95) Prestroke mm Note remarks Rack travel in mm : 9.00...12.00 : 6-2-4-1-5-3 : MAN 11,9a42 Firing order Test sheet : 06.07.90 Edition Replaces : ISO-4113 Test oil : 0-60-120-180-240-300 Phasing : 0 402 036 081 Combination no. Tolerance + - ° : 0.50 (0.75) Injection pump : PES6P120A720/3LS470-Time to cyl. no. : 6 Pump designation EP type number : 0 412 026 050 BASIC SETTING Governor Governor design. : RQ300/1070PA813-16 1st speed rpm: 750 Governer no. : 0 421 801 531 Rack travel in mm : 10.20...10.30 Customer-spec. information Del.quantity cm3/: 18.3...18.5 Customer 100 s: (18.0...18.8) : 02866LF 04..LH01 Engine cm3 : 0.51st version kW ে 🖅 1.0 Spread Rated speed . 1000 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 300.02nd speed Rack travel in mm: 4.7...4.9 Test oil Del.quantity cm3/: 1.2...1.8 inlet temp. °C : 38...42 100 s: (0.9...2.1) Overflow valve Spread cm3 : 0.8: 1 417 413 025 100 s: (1.2) GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Degree: -2 Test nozzle holder : 1 688 901 019 rpm : 600 assembly Speed Rack travel in mm : 19.20...20.80 Opening FULL LOAD DELIV. AT FULL LOAD STOP : 207...210 pressure, bar 1st version Orifice plate Speed rpm : 750 diameter mm : 0,8 Aneroid pressure h: 1000 Anerota Del. quantity 1000 : 183.0...185.0 Test lines : 1 680 750 067 : (180.0...188.0) Spread cm3 : 5.00 Outside diameter 1000 : (9.00) x Wall thickness : 6.00x1.50x1000 x Length mm RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set equal delivery quant. Setting point: per values Speed rpm : 600 Rack travel in mm : 20.0

Testing:

H05

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

1st rack travel in: 8.80 rpm : 1045...1060 Speed 2nd rack travel in: 4.00 rpm : 1100...1130 Speed 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 4.8 Testing: rpm : 100 Speed Minimum rack trave: 6.30 rpm : 300 Speed Rack travel in mm : 4.70...4 90 Rack travel in mm : 2.00 rpm : 355...395 Speed TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 9.80...9.90 rpm : 750 2nd speed Rack travel in m: 10.50...10.70 3rd speed rpm : 850 Rack travel in m: 10.10...10.30 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 1000 Pressure : 10.20...10.30 Rack travel mm Measurement Speed  $1/\min : 500$ 1st pressure hPa : -Rack travel in m: 8.90...9.10 2nd pressure hPa : 85 Rack travel in m: 9.30...9.40 3rd pressure hPa : 160 Rack travel in m: 9.70...10.00 START CUT-OUT 1/min: 190 (210) Speed FUEL DELIVERY CHARACTERISTICS 1st version

Del.quantity cm3/: 179.0...185.0 1000 s: (176.0...188.0) Aneroid pressure h: 1000 Speed rpm : 650 Del.quantity cm3/: 174.0...180.0 1000 s: (171.0...183.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity\_cm3/ : 132.0...134.0 1000 s: (129.0...137.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 8.80 rpm : 1045...1060 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 225.0...245.0 1000 s: (221.0...249.0) LOW IDLE : 300 Speed rpm Rack travel in mm : 4.70...4.90 Del.quantity cm3/: 12.0...18.0 1000 s: (9.0...21.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: : MAN-NR. 3-7053 Setting and blocking of pointer of start-of-delivery sensor on cyl. 6

start of delivery

H06

Speed

Aneroid pressure h: 1000

rpm

: 1000

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAN 11,9a43 Test sheet Edition : 14.09.90 Replaces Test oil : ISO-4113 Combination no. : 0 402 036 082 Injection pump Pump designation: PES6P120A720/3LS470-EP type number : 0 412 026 050 Governor Governor design. : RQV300.. 1000PA876-7 : 0 421 813 867 Governer no. Customer-spec. information : MAN Customer : D2866LF 04..LH01 Engine : 221.0 : 2000 1st version kW Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 30...32

: 2.80...2.90 Prestroke mm : (2.75...2.95) Rack travel in mm : 9.00...12.00 : 6-2-4-1-5-3 Firing order Phasing : 0-60-120-180-240-300 : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 6 BASIC SETTING rpm: 750 1st speed Rack travel in mm : 10.20...10.30 Del.quantity cm3/: 18.3...18.5 100 s: (18.0...18.8) cm3 : 0.5Spread 100 s: (0.9) rpm : 300.02nd speed Rack travel in mm: 4.7...4.9 Del.quantity cm3/ : 1.2...1.8 100 s: (0.9...2.1) cm3 : 0.8Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1045 1st speed travel mm 9.90...10.10 rpm : 300 2nd speed : 1.60...1.80 travel mm rpm : 500 3rd speed : 3.40...4.00 travel mm 4th speed rpm : 800 : 6.70...7.10 travel mm : 1250 5th speed rom : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1100 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version

rpm : 750

Speed

Aneroid pressure h: 1000 Del.quantity : 183.0...185.0 3rd pressure hPa : 160 Rack travel in m: 9.70...10.00 1000 : (180.0...188.0) : 5.00 START CUT-OUT Spread cm3 1000 : (9.00) 1/min : 220 (240) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 296...304 1st version Aneroid pressure h: 1000 rpm : 1000 Speed Testing: Del.quantity cm3/: 179.0...185.0 1st rack travel in: 8.80 1000 s: (176.0...188.0) Speed rpm : 1040...1050 2nd rack travel in: 4.00 Aneroid pressure h: 1000 rpm : 1090...1120 rpm : 650 Speed Speed Del.quantity cm3/: 174.0...180.0 1000 s: (171.0...183.0) 4th rack travel in: 1250 rpm : 0.00...1.00Speed Aneroid pressure h: rpm : 500 LOW IDLE 1 Speed Del.quantity cm3/: 132.0...134.0 Control lever 1000 s: (129.0...137.0) position degrees: 256...264 Testing: Speed : 100 **BREAKAWAY** rpm Minimum rack trave: 6.30 1st version rpm : 300 Rack travel in mm : 4.70...4.90 1mm rack travel less than full load rack tr: 8.80 CONSTANT REGULATION rpm : 1040...1050 rpm : 280...390 Speed Speed TORQUE CONTROL STARTING FUEL DELIVERY Dimension a mm : 0.40 Torque control curve - 1st version rpm : 1000 rpm : 100 1st speed Speed Del.quantity cm3/: 225.0...245.0 Rack travel in m: 9.80...9.90 1000 s: (221.0...249.0) rpm : 750 2nd speed Rack travel in m: 10.20...10.30 3rd speed rpm : 900 LOW IDLE Rack travel in m: 10.00...10.10 Speed rpm : 300 Rack travel in mm : 4.70...4.90 Aneroid/Altitude Del.quantity cm3/: 12.0...18.0 Compensator Test 1000 s: (9.0...21.0) cm3 : 8.00Spread 1000 s: (12.00) 1st version Setting : 500 Remarks: Speed rpm hPa : 1000 : MAN-NR. 3-7054 Pressure : 10.20...10.30 Rack travel mm Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 Measurement  $1/\min : 500$ start of delivery Speed 1st pressure hPa : -Rack travel in m: 8.90...9.10 2nd pressure hPa : 85

Rack travel in m: 9.30...9.40

: 3.70...3.80 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.65...3.85) Rack travel in mm : 9.00...12.00 Note remarks : 6-2-4-1-5-3 Firing order Test sheet : MAN 11,9 j2 Edition : 06.07.90 : 30.3.90 Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasing Tolerance + - ° : 0.50 (0.75) Combination no. : 0 402 036 729 Injection pump Time to cyl. no. : 6 Pump designation : PES6P120A720/3LS3205 : 0 412 026 729 BASIC SETTING EP type number Governor rpm: 700 Governor design. : RQ300/1100PA813-7 1st speed : 0 421 801 474 Governer no. Rack travel in mm : 13.50...13.60 Customer-spec. information Customer : MAN Del.quantity cm3/: 24.2...24.4 100 s: (23.9...24.7) Engine : D2866LXUH cm3 : 0.51st version kW : 273.0 Spread : 2200 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 300.02nd speed Rack travel in mm: 4.3...4.5 Test oil Del.quantity cm3/: 1.7...2.3 inlet temp. °C : 38...42 100 s: (1.4...2.6) cm3 : 0.8Overflow valve Spread 100 s: (1.2) : 1 417 413 025 GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Degree: -2 Test nozzle holder rpm : 650 : 1 688 901 019 assembly Speed Rack travel in mm : 14.70...16.30 Opening | FULL LOAD DELIV. AT FULL LOAD STOP : 207...210 pressure, bar 1st version Orifice plate : 0,8 Speed rpm : 700 diameter mm Aneroid pressure h: 1200 : 242.0...244.0 Del.quantity 1000 : (239.0...247.0) Test lines : 1 680 750 067 cm3 : 5.00 Spread 1000 : (9.00) Outside diameter x Wall thickness : 6.00x1.50x1000 RATED SPEED x Length mm (A) Injection pump setting values 1st version Insp. values in parentheses Setting point: Set equal delivery quant. : 650 per values Speed rpm Rack travel in mm: 15.5 BEGINNING OF DELIVERY Test pressure, bar: 25...27 Testing:

1st rack travel in: 12.10

rpm : 1145...1160 Speed 2nd rack travel in: 4.00 rpm : 1190...1220 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.00LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 4.4 Testing: Speed : 100 rpm Minimum rack trave: 5.90 : 300 rpm Rack travel in mm : 4.30...4.50 Rack travel in mm : 2.00 Speed rpm : 380...420 TORGUE CONTROL Dimension a mm : 0.20 Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 13.10...13.20 rpm : 700 2nd speed Rack travel in m: 14.30...14.40 3rd speed rpm : 885 Rack travel in m: 13.80...14.10 rpm : 935 4th speed Rack travel in m: 13.30...13.60 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : 1200 : 13.50...13.60 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 9.50...9.70 2nd pressure hPa : 190 Rack travel in m: 9.90...10.00 3rd pressure hPa : 520 Rack travel in m: 12.00...12.30 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version

rpm : 1100 Speed Del.quantity cm3/: 230.0...236.0 1000 s: (227.0...239.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 120.0...122.0 1000 s: (117.0...125.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.10 rpm : 1145...1160 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 230.0...250.0 1000 s: (226.0...254.0) LOW IDLE rpm : 300 Speed Rack travel in mm : 4.30...4.50 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) Spread cm3 : 8.001000 s: (12.00) Remarks: : MAN-NR. 2-7946 APPLICATION **Omnibus** 

H10

Aneroid pressure h: 1200

: 3.70...3.80 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.65...3.85) Rack travel in mm : 14.50...15.50 Firing order : 6-2-4-1-5-3 Note remarks : MAN 11,9 p Test sheet : 03.08.90 Edition : 30.3.90 Replaces : 0-60-120-180-240-300 : ISO-4113 Phasing Test oil Combination no. : 0 402 036 733 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 6 Injection pump Pump designation : PES6P120A720/3LS3247 : 0 412 026 735 BEGINNING OF DELIVERY DIFFERENCE EP type number Governor Governor design. : RQV300...1100PA876-4 betw. rack trav. m: 5.90...6.10 & maximum rack tra: 14.5...15.5 Governer no. : 0 421 813 851 Difference ° CS : 2.00...4.00 Customer-spec, information BASIC SETTING Customer : MAN : D2866LXF/A00 1st speed rpm : 700 Engine Rack travel in mm : 15.00...15.10 : 273.0 1st version kW : 2200 Rated speed Del.quantity cm3/: 24.2...24.4 TEST BENCH REQUIREMENTS 100 s: (23.9...24.7) Test oil inlet temp. °C : 38...42 Spread cm3 : 0.5100 s: (0.9) Overflow valve : 1 417 413 025 rpm : 300.02nd speed Rack travel in mm: 4.8...5.2 Inlet press., bar: 1.50 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) Spread cm3: 0.8 Test nozzle holder : 1 688 901 019 assembly 100 s: (1.2) Openina : 207...210 (B) Setting of injection pump pressure, bar with governor Orifice plate GUIDE SLEEVE TRAVEL diameter mm : 0,8 rpm : 1145 1st speed : 8.30...8.50 travel mm rpm : 300 Test lines : 1 680 750 067 2nd speed travel mm : 1.10...1.30 Outside diameter 3rd speed rpm : 500 : 2.90...3.50 x Wall thickness travel mm x Length mm : 6.00x1.50x1000 4th speed rpm : 900 : 5.90...6.30 travel mm : 1450 (A) Injection pump setting values 5th speed rpm : 11.00...12.00 Insp. values in parentheses travel mm Set equal delivery quant.

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1140

Rack travel in mm : 15.20...17.80

H11

per values

Test pressure, bar: 30...32

BEGINNING OF DELIVERY

FULL LOAD DELIV. AT FULL LOAD STOP 1st version : 700 Speed rom Aneroid pressure h: 1200 : 242.0...244.0 Del.quantity 1000 : (239.0...247.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 298...306 Testing: 1st rack travel in: 13.60 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rpm : 1260...1290 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 259...267 Testing: Speed : 200 rom Minimum rack trave: 6.50 : 300 rom Rack travel in mm : 4.90...5.10 CONSTANT REGULATION rpm : 320...430 Speed TORQUE CONTROL Dimension a mm : 0.50 Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 14.50...14.60 2nd speed rpm : 700 Rack travel in m: 15.00...15.10 : 950 3rd speed rpm Rack travel in m: 14.70...14.90 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : 1200 : 15.00...15.10 Rack travel mm Measurement

1/min: 500

1st pressure hPa : -Rack travel in m: 11.70...11.90 2nd pressure hPa : 110 Rack travel in m: 12.00...12.10 3rd pressure hPa : 470 Rack travel in m: 14.00...14.40 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 1100 Speed rpm Del.quantity cm3/: 230.0...236.0 1000 s: (227.0...239.0) rpm 700 Speed Del.quantity cm3/: 95.0...101.0 1000 s: (92.0...104.0) Aneroid pressure h: -: 500 rpm Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.60 rpm : 1140...1150 Speed INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0) LOW IDLE : 300 Speed rpm Rack travel in mm : 4.80...5.20 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) cm3 : 8.00 1000 s: (12.00) Spread Remarks:

: MAN-NR. 2-7890

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 u2 : 21.09.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 036 736

Injection pump

Pump designation: PES6P120A720/3LS3255

: 0 412 026 739 EP type number

Governor

Governor design. : RQ300/1100PA813-12

: 0 421 801 518 Governer no.

Customer-spec. information Customer : MAN

Engine : D2866LF01

: 273.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina (

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm : (3.65...3.85)

Rack travel in mm : 14.50...15.50 Firing order : 6-2-4-1-5-3

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.00...4.00

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 15.00...15.10

Del.quantity cm3/: 24.2...24.4

100 s: (23.9...24.7)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.0...5.4 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 1200

Del.quantity : 242.0...247.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point: : 600 Speed rpm Rack travel in mm: 20.0 Testing: 1st rack travel in: 13.80 Speed rpm : 1145...1160 2nd rack travel in: 4.00 rpm : 1200...1230 Speed 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 5.2 Testina: : 200 Speed rpm Minimum rack trave: 6.70 : 300 Speed rom Rack travel in mm : 5.10...5.30 Rack travel in mm: 2.00 : 360...400 Speed rpm TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 14.80...14.90 rpm : 700 2nd speed Rack travel in m: 15.40...15.60 3rd speed rpm : 900 Rack travel in m: 15.20...15.40 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 Pressure hPa : 1200 : 15.00...15.10 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 11.60...11.90 2nd pressure hPa : 110 Rack travel in m: 12.00...12.10 3rd pressure hPa : 470 Rack travel in m: 14.00...14.40 START CUT-OUT

1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1200 Speed rpm : 1100 Del.quantity cm3/: 230.0...236.0 1000 s: (227.0...239.0) 700 rpm Del.quantity cm3/: 90.0...100.0 1000 s: (-) Aneroid pressure h: rpm\_ : 500 Speed Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.80 rpm : 1145...1160 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 210.0...230.0 1000 s: (206.0...234.0) LOW IDLE Speed : 300 rpm Rack travel in mm : 5.00...5.40 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) Spread cm3 : 8.00 1000 s: (12.00) Remarks: : MAN-NR. 2-7889

Speed

: 3.70...3.80 : (3.65...3.85) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 14.50...15.50 Note remarks : 6-2-4-1-5-3 Firing order : MAN 11,9 u3 Test sheet Edition : 06.07.90 Replaces : 0-60-120-180-240-300 : ISO-4113 Test oil Phasing : 0.50 (0.75) Tolerance + - ° Combination no. : 0 402 036 737 Time to cyl. no. : 6 Injection pump Pump designation : PES6P120A720/3LS3255 : 0 412 026 739 BEGINNING OF DELIVERY DIFFERENCE EP type number Governor betw. rack trav. m: 5.90...6.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.00...4.00 Governor design. : RQV300...1100PA876-4 : 0 421 813 851 Governer no. Customer spec. information : MAN BASIC SETTING Customer Engine : D2866LF01 1st speed rpm: 700 : 273.0 Rack travel in mm : 15.00...15.10 1st version kW : 2200 Rated speed Del.quantity cm3/: 24.2...24.4 TEST BENCH REQUIREMENTS 100 s: (23.9...24.7) Test oil cm3 : 0.5inlet temp. °C : 38...42 Spread 100 s: (0.9) Overflow valve : 1 417 413 025 2nd speed rpm : 300.0 Rack travel in mm : 4.7...5.1 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Spread cm3 : 0.8Openina : 207...210 pressure, bar with governor Orifice plate : 0,8 diameter mm GUIDE SLEEVE TRAVEL 1st speed travel mm Test lines : 1 680 750 067 rpm : 300 2nd speed travel mm rpm : 500Outside diameter 3rd speed travel mm x Wall thickness : 6.00x1.50x1000 rpm : 800 x Length mm 4th speed

Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) 100 s: (1.2) (B) Setting of injection pump rpm : 1145 : 8.30...8.50 : 1.10...1.30 : 3.00...3.40 travel mm : 5.20...5.60 5th speed rpm : 1400travel mm : 11.00...12.00 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1150 Rack travel in mm : 15.20...17.80

(A) Injection pump setting values

Set equal delivery quant.

per values

Test pressure, bar: 30...32

BEGINNING OF DELIVERY

Insp. values in parentheses

FULL LOAD DELIV. AT FULL LOAD STOP 1st pressure hPa : -Rack travel in m: 11.70...11.90 2nd pressure hPa : 110 1st version Rack travel in m: 12.10...12.20 rpm : 700 Speed Aneroid pressure h: 1200 3rd pressure hPa : 470 Del.quantity : 242.0...247.0)

Spread cm3 : 5.00

1000 : (9.00) Rack travel in m: 14.30...14.70 START CUT-OUT 1/min: 220 (240) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 296...304 1st version Aneroid pressure h: 1200 rpm : 1100 Testing: Speed Del.quantity cm3/: 2 1000 s: 1st rack travel in: 13.70 Speed rpm : 1140...1150 ر. 0.گ 239.0)2nd rack travel in: 4.00 Speed rpm rpm : 1255...1285 2.0 Del.quantity cm3/ Speed 1000 .100.0)4th rack travel in: 1300 rpm : 0.00...1.00 Spread cm3 Speed 10P LOW IDLE 1 Speed 0...136.0 Control lever Del.quanti: ..0...139.0) position degrees: 259...267 Testing: : 200 **BREAKAK** Speed rom Minimum rack trave: 6.00 rpm : 300 1st version Speed Rack travel in mm: 4.90...5.10 1mm rack travel less than full load rack tr: 13.70 CONSTANT REGULATION Speed ' rpm : 320...430 rpm : 1140...1150 Speed INTERMEDIATE RATED SPEED TORQUE CONTROL Rack travel in mm: 4.00 Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 1100 STARTING FUEL DELIVERY Rack travel in m: 14.70...14.80 d speed rpm : 700 2nd speed Rack travel in m: 15.00...15.10 d speed rpm : 900 Speed rpm : 100 Del.quantity cm3/ : 210.0...230.0 1000 s: (206.0...234.0) 3rd speed Rack travel in m: 14.80...14.90 LOW IDLE Aneroid/Altitude Compensator Test Speed rpm : 300 Rack travel in mm : 4.70...5.10 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) 1st version Setting : 500 Speed Spread cm3 : 8.00 rpm hPa : 1200 1000 s: (12.00) Pressure : 15.00...15.10 Rack travel mm Remarks: : MAN-NR. 2-7890 Measurement 1/min : 500 Speed

H16

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 v Edition : 29.06.90

Replaces

: ISO-4113 Test oil

: 0 402 036 738 Combination no.

Injection pump

Pump designation : PES6P120A720/3LS3254

: 0 412 026 740 EP type number

Governor

Governor design. : RQV300...950PA959 Governer no. : 0 421 813 860

Customer-spec. information Customer : MAN

: D2866LF02 Engine

: 250.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65...3.85) Rack travel in mm : 14.50...15.50

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.00...4.00

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 15.00...15.10

Del.quantity cm3/: 24.2...24.4

100 s: (23.9...24.7)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm : 4.7...5.1 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 995 1st speed

: 9.70...9.90 travel mm

2nd speed rpm : 300

: 0.90...1.10 travel mm

rpm : 500 3rd speed

: 3.40...4.00 travel mm

rpm : 750 4th speed

: 6.60...7.00 travel mm

rpm : 1250 5th speed

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1025

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 1200

: 242.0...244.0 Del.quantity 1000 : (239.0...247.0)

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 298...306

Testina:

1st rack travel in: 13.50 rpm : 990...1000 Speed

2nd rack travel in: 4.00

Speed rpm : 1070...1100 4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 254...262

Testina:

Speed : 200 rpm Minimum rack trave: 6.40 : 300 Speed rpm

Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

rpm : 320...430 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 1200 Pressure

: 15.00...15.10 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 11.60...11.80

2nd pressure hPa : 110

Rack travel in m: 12.00...12.10

3rd pressure hPa : 470

Rack travel in m: 13.70...14.10

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed : 950 rpm

Del.quantity cm3/: 228.0...234.0 1000 s: (225.0...237.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 134.0...136.0

1000 s: (131.0...139.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.50

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 210.0...230.0

1000 s: (206.0...234.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.70...5.10 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MAN-NR. 2-7942

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MAN 11,9 w Test sheet : 21.09.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 036 739

Injection pump

Pump designation: PES6P120A720/3LS3254

EP type number : 0 412 026 741

Governor

Governor design. : RQ300/957PA813-10

: 0 421 801 493 Governer no.

Customer-spec. information Customer : MAN

: D2866LF02 Engine

: 250.0 1st version kW Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening 1

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm : (3.65...3.85)

Rack travel in mm : 14.50...15.50

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasina

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 15.00...15.10

Del.quantity cm3/: 24.2...24.4

100 s: (23.9...24.7)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.7...5.1 Del.quantity cm3/ : 1.7...2.3 100 s: (1.4...2.6)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 550

Speed Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 1200

: 242.0...244.0 Del.quantity

1000 : (239.0...247.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point: : 550 Speed rpm Rack travel in mm : 20.0 Testina: 1st rack travel in: 13.50 Speed rpm : 995...1110 2nd rack travel in: 4.00 rpm : 1040...1070 Speed 4th rack travel in: 1200 rpm : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring : 300 rpm Rack travel in mm: 4.90 Testina: Speed : 200 rpm Minimum rack trave: 6.40 rpm : 300 Speed Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 320...430 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 950 Rack travel in m: 14.50...14.60 rpm : 700 2nd speed Rack travel in m: 15.10...15.30 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : 1200 Pressure Rack travel mm Measurement

: 15.00...15.10 1/min: 500 Speed

1st pressure hPa : -Rack travel in m: 11.60...11.80 2nd pressure hPa : 110 Rack travel in m: 12.00...12.10 3rd pressure hPa : 470 Rack travel in m: 13.70...14.10

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 950

Speed rpm

Del.quantity cm3/: 228.0...234.0 1000 s: (225.0...237.0)

Speed 700 rpm

Del.quantity cm3/: 93.0...101.0 1000 s: (90.0...104.0)

Spread cm3 : 10.001000 s: (14.0) Aneroid pressure h:

rpm : 500 Speed

Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.50 rpm : 995...1110 beed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 210.0...230.0

1000 s: (206.0...234.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.70...5.10 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0)

cm3 : 8.00 Spread 1000 s: (12.00)

Remarks:

: MAN-NR. 2-7962

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 start of delivery

H21

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MAN 11,9 u4 Test sheet Edition : 31.07.90

Replaces

Test oil : ISO-4113

Combination no. : 0 402 036 742

Injection pump

Pump designation : PES6P120A720/3LS3255

: 0 412 026 739 EP type number

Governor

Governor design. : RQ300/1100PA813-7

: 0 421 801 474 Governer no.

Customer-spec. information Customer : MAN

: D2866LF01 **Engine** 

: 273.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm : (3.65...3.85)

Rack travel in mm : 14.50...15.50 Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.00...4.00

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 15.00...15.10

Del.guantity cm3/: 24.2...24.4

100 s: (23.9...24.7)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm : 4.7...5.1 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6)

Spread cm3 : 0.8100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 1200

: 242.0...244.0 Del.quantity : (239.0...247.0) 1000

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point: : 600 Speed rpm Rack travel in mm: 20.0 Testina: 1st rack travel in: 13.50 rpm : 1145...1160 Speed 2nd rack travel in: 4.00 rpm : 1200...1230 Speed 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 4.9 Testina: rpm : 200 Speed Minimum rack trave: 5.90 rpm : 300 Speed Rack travel in mm : 4.80...5.00 Rack travel in mm: 2.00 Speed rom : 400...440 TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 14.50...14.60 2nd speed rpm : 700 Rack travel in m: 15.10...15.30 od speed rpm : 900 3rd speed Rack travel in m: 14.80...15.00 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rom hPa : 1200 Pressure Rack travel mm : 15.00...15.10 Measurement  $1/\min : 500$ Speed 1st pressure hPa : -

Rack travel in m: 11.60...11.80 2nd pressure hPa : 110 Rack travel in m: 12.00...12.10 3rd pressure hPa : 520 Rack travel in m: 13.70...14.10

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 1100 Del.quantity cm3/: 230.0...236.0

1000 s: (227.0...239.0)

Aneroid pressure h: -Speed

rpm : 500 Del.quantity cm3/: 134.0...136.0

1000 s: (131.0...139.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.50 Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 210.0...230.0 1000 s: (206.0...234.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.70...5.10 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0)

cm3 : 8.00

Spread 1000 s: (12.00)

Remarks:

: MAN-NR. 2-7946

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 start of delivery

H23

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.80...2.90 : (2.75...2.95) Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1-5-3-6-2-4 Test sheet : RVI 12,0 c Edition : 06.07.90 : 6.4.90 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 : 0.50 (0.75) Combination no. : 0 402 046 219 Tolerance + - ° Injection pump BASIC SETTING Pump designation : PES6P120A320RS426 : 0 412 026 039 1st speed rpm : 650 EP type number Governor Governor design. : RQV250...1100PA570 Governor no. : 0 421 813 295 Rack travel in mm : 10.30...10.40 Del.quantity cm3/: 17.9...18.1 Customer-spec, information 100 s: (17.6...18.4) Customer : RVI cm3 : 0.5: MIDS 063540 Engine Spread : 195.0 100 s: (0.9) 1st version kW : 2200 Rated speed 2nd speed rpm : 250.0 Rack travel in mm : 4.5...4.7 Del.quantity cm3/ : 1.9...2.5 TEST BENCH REQUIREMENTS 100 s: (1.6...2.8) Test oil inlet temp. °C cm3 : 0.8: 38...42 Spread 100 s: (1.2) Overflow valve : 1 417 413 025 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL rpm : 250 : 1.50...1.60 Test nozzle holder 1st speed : 1 688 901 019 assembly travel mm 008 : man 2nd speed : 4.70...4.90 Opening 1997 travel mm rpm : 1100 pressure, bar : 207...210 3rd speed travel mm : 6.80...7.00 Orifice plate diameter mm : 0,8 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1270 Test lines : 1 680 750 067 Speed Rack travel in mm : 15.20...17.80 Outside diameter FULL LOAD DELIV. AT FULL LOAD STOP x Wall thickness : 6.00X1.50X1000 x Length mm 1st version Speed rpm : 650(A) Injection pump setting values Aneroid pressure h: 700 Insp. values in parentheses : 179.0...181.0 Set equal delivery quant. Del.quantity 1000 : (176.0...184.0) per values : 5.00 cm3 Spread 1000 : (9.00) BEGINNING OF DELIVERY

RATED SPEED

Test pressure, bar: 25...27

1st version Control Lever

position degrees: 116...124

Testina:

1st rack travel in: 8.10

Speed rpm : 1160...1170 2nd rack travel in: 4.00

rpm : 1230...1260 Speed

4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW TDLE 1

Control lever

position degrees: 64...72

Testina:

Speed : 200 rpm Minimum rack trave: 5.70 : 250 Speed rpm

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

rpm : 275...400 Speed

TORQUE CONTROL

Dimension a mm : 1.20

Torque control curve - 1st version

rpm : 650 1st speed

Rack travel in m: 10.30...10.40

rpm : 1100 2nd speed

Rack travel in m: 9.00...9.20

rpm : 1020 3rd speed

Rack travel in m: 9.30...9.50

4th speed rpm : 890

Rack travel in m: 9.90...10.10

Aneroid/Altitude

Compensator Test

1st version

Setting

rpm : 500 hPa : 700 Speed rom Pressure

: 10.30...10.40 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.40...8.60

2nd pressure hPa : 290

Rack travel in m: 9.90...10.00 3rd pressure hPa : 245

Rack travel in m: 8.90...9.10

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm: 1100 Del.quantity cm3/: 164.0...170.0 1000 s: (161.0...173.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 119.0...121.0

1000 s: (116.0...124.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.10

rpm : 1160...1170 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...165.0 1000 s: (131.0...169.0)

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 19.0...25.0 1000 s: (16.0...28.0) Spread cm3: 8.00

1000 s: (12.00)

Remarks:

Start-of-delivery mark 12° cam angle

after start of delivery cyl. 1.

: 2.80...2.90 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (2.75...2.95) Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order : RVI 9,8 k : 20.07.90 Test sheet Fdition : 6.4.90 Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasing Tolerance + - ° : 0.50 (0.75) Combination no. : 0 402 046 340 Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A320RS525 : 0 412 026 058 BASIC SETTING EP type number Governor Governor design. : RQV300...1050PA955 1st speed rpm : 1050: 0 421 813 856 Governer no. Rack travel in mm : 9.20...9.30 Customer-spec. information Del.quantity cm3/: 13.5...13.7 Customer : RVT 100 s: (13.2...14.0) Engine : MIDSO62045J Spread cm3 : 0.51st version kW : 160.0 Rated speed : 2100 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 300.02nd speed Rack travel in mm: 5.3...5.5 Test oil Del.quantity cm3/: 1.5...2.1 : 38...42 inlet temp. °C 100 s: (1.2...2.4) cm3 : 0.8Overflow valve Spread 100 s: (1.2) ± 1 417 413 025 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder : 1 688 901 019 GUIDE SLEEVE TRAVEL assembly rpm : 10501st speed 8.00...8.20 travel mm Opening rpm : 300 pressure, bar : 207...210 2nd speed 1.10...1.50 travel mm 3rd speed rpm : 430 Orifice plate : 3.40...4.00 : 0,8 travel mm diameter mm 4th speed rpm : 1400 : 11.00...12.00 travel mm Test lines : 1 680 750 067 GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 rpm : 1075 : 6.00X1.50X1000 Speed x Length mm Rack travel in mm : 15.20...17.80 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Rack travel in mm: 15.20...17.80

FUL'L LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm: 1050
Del.quantity: 135.0...137.0
1000: (132.0...140.0)

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Spread cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 298...306

Testing:

1st rack travel in: 8.20

rpm : 1120...1130 Speed

2nd rack travel in: 4.00

Speed rpm : 1175...1205 4th rack travel in: 1350

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 244...252

Testing:

Speed rpm : 200 Minimum rack trave: 7.80

Speed rpm : 300 Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

rpm : 310...430 Speed

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700

Del.quantity cm3/: 124.0...132.0 1000 s: (121.0...135.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.20

rpm : 1120...1130 beea

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0

1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 5.30...5.50 Del.quantity cm3/: 15.0...21.0 1000 s: (12.0...24.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : ROL 12.2 h1 : 20.07.90 Test sheet Edition : 9.3.87 Replaces : ISO-4113 Test oil Combination no. : 0 402 046 772 Injection pump Pump designation : PES6P120A320RS3170 : 0 412 026 722 EP type number Governor Governor design. : RQV250...950PA794-1. : 0 421 813 579 Governer no. Customer-spec. information Customer : ROLLS ROYCE Engine : EAGLE LE 300 : 204.0 1st version kW : 1900 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate : 0,8 diameter mm : 1 680 750 067 Test lines Outside diameter x Wall thickness : 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 H28

: 3.50...3.60 Prestroke mm : (3.45...3.65) Rack travel in mm : 9.00...12.00 : 1-4-2-6-3-5 Firing order : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) BASIC SETTING rpm: 900 1st speed Rack travel in mm : 12.90...13.00 Del.guantity cm3/: 21.5...21.7 100 s: (21.2...22.0) cm3 : 0.5Spread 100 s: (0.9) rpm : 250.02nd speed Rack travel in mm : 5.6...5.8 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) cm3 : 0.8Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 1.50...1.70 travel mm 2nd speed 350 rpm : : 2.20...2.70 travel mm rpm : 500 3rd speed : 3.00...3.40 travel mm rpm : 1000 4th speed : 8.00...8.20 travel mm 5th speed rpm: 1060 travel mm : 8.90...9.20 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1000 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 900 Speed Aneroid pressure h: 700

: 215.0...217.0

1000 : (212.0...220.0)

Del.quantity

cm3 : 5.00Spread

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 117...125

Testing:

1st rack travel in: 11.90

rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1055...1085 Speed

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 81...89

Testing:

Speed rpm : 100 Minimum rack trave: 7.00

rpm : 250

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

rpm : 250...470 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm hPa : 700 Pressure

: 12.90...13.00 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.50...11.70

2nd pressure hPa : 330

Rack travel in m: 12.00...12.10 3rd pressure hPa : 440

Rack travel in m: 12.60...12.80

START CUT-OUT

1/min: 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 Speed rpm : 500

J01

Del.quantity cm3/: 203.0...209.0

1000 s: (200.0...212.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 170.0...174.0 1000 s: (167.0...177.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...170.0

1000 s: (136.0...174.0)

Remarks:

: 3.50...3.60 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.45...3.65) Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order : RV1 9,8 f Test sheet : 01.06.90 Edition : 30.9.88 Replaces : ISO-4113 : 0-60-120-180-240-300 Test oil Phasing Tolerance + - ° : 0.50 (0.75) Combination no. : 0 402 046 798 BASIC SETTING Injection pump Pump designation : PES6P120A320RS3139 : 0 412 026 718 rpm: 600 1st speed EP type number Governor Rack travel in mm : 11.80...11.90 Governor design. : RQ275/1050PA893 : 0 421 801 442 Governer no. Del.quantity cm3/: 21.8...22.0 Customer-spec. information 100 s: (21.5...22.3) Customer : RVI cm3 : 0.5 : MIDR 062045 M Spread Engine 100 s: (0.9) : 236.0 1st version kW : 2100 Rated speed rpm : 275.0 2nd speed Rack travel in mm : 5.2...5.6 Del.quantity cm3/ : 2.2...2.8 TEST BENCH REQUIREMENTS 100 s: (1.9...3.1) Test oil inlet temp. °C : 38...42 cm3 : 0.8Spread 100 s: (1.2) Overflow valve : 1 417 413 025 GUIDE SLEEVE POSITION Control-lever position Degree: -2 Inlet press., bar: 1.50 rpm : 600 Rack travel in mm : 19.20...20.80 Test nozzle holder : 1 688 901 019 assembly FULL LOAD DELIV. AT FULL LOAD STOP Opening : 207...210 1st version pressure, bar Speed rpm : 600 Aneroid pressure h: 1000 Orifice plate : 218.0...220.0 diameter mm : 0,8 Del.quantity : (215.0...223.0) 1000 : 5.00 cm3 Spread : 1 680 750 067 1000 : (9.00) Test lines RATED SPEED Outside diameter x Wall thickness : 6.00x1.50x1000 1st version x Length mm (A) Injection pump setting values Setting point: : 600 Insp. values in parentheses Speed rpm Rack travel in mm: 20.0 Set equal delivery quant. per values Testing: 1st rack travel in: 10.80 BEGINNING OF DELIVERY

rpm : 1115...1130

Speed

2nd rack travel in: 4.30

Test pressure, bar: 25...27

rpm : 1205...1235 Speed 4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

: 275 Speed rom Rack travel in mm: 5.4

Testing:

Speed rpm : 200 Minimum rack trave: 7.10 rpm : 27 Speed

Rack travel in mm : 5.30...5.50 Rack travel in mm: 2.30

Speed rom : 340...380

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 0.40...0.60

2nd speed rpm : 1050

Rack travel in m: 0.30...0.60

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rom hPa : 1000 Pressure

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.50...8.90

2nd pressure hPa : 360

Rack travel in m: 11.00...11.10

3rd pressure hPa : 160

Rack travel in m: 9.40...9.60

START CUT-OUT

1/min: 195 (215) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

rpm\_ : 1050 Speed

Del.quantity cm3/: 217.0...223.0

1000 s: (214.0...226.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 101.0...103.0

1000 s: (98.0...106.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.80

: 1115...1130 Speed rom

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

LOW IDLE

Speed rpm

Rack travel in mm : 5.20...5.60

Del.quantity cm3/: 22.0...28.0 1000 s: (19.0...31.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

**APPLICATION** 

Omnibus

Prestroke mm : 3.50...3.60 : (3.45...3.65)
Rack travel in mm : 2.00...12.00 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : 1-5-3-6-2-4 Firing order : FIA 7,7 a Test sheet : 17.09.90 Edition Replaces : 0-60-120-180-240-300 : ISO-4113 Phasing Test oil Tolerance + - ° : 0.50 (0.75) Combination no. : 0 402 046 815 Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A720RS3249 : 0 412 026 737 BASIC SETTING EP type number Governor Governor design. : RQV300...1100PA954K. rpm: 1100 1st speed : 0 421 815 243 Governer no. Rack travel in mm : 13.60...13.70 Customer-spec. information : IVECO-FIAT Del.quantity cm3/: 21.1...21.3 Customer 100 s: (20.8...21.6) : 8360,46,007 Engine : 196.0 Spread cm3 : 0.51st version kW : 2200 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 300.0 2nd speed Rack travel in mm: 5.0...5.4 Test oil Del.quantity cm3/: 2.0...2.6 inlet temp. °C : 38...42 100 s: (1.7...2.9) cm3 : 0.8 Overflow valve Spread 100 s: (1.2) : 1 417 413 025 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder : 1 688 901 105 GUIDE SLEEVE TRAVEL assembly rpm : 1160 1st speed : 10.60...10.80 travel mm Opening . rpm : 300 pressure, bar : 207...210 2nd speed 1.00...1.40 travel mm rpm : 850 3rd speed Orifice plate : 6.60...7.00 diameter mm : 0,8 travel mm rpm : 1350 4th speed : 13.00...14.00 travel mm : 1 680 750 008 Test lines GUIDE SLEEVE POSITION Control-lever position Outside diameter Degree: -1 x Wall thickness Speed rpm : 1150 Rack travel in mm : 15.20...17.80 : 6.00X2.00X600 x Length mm (A) Injection pump setting values FULL LOAD DELIV. AT FULL LOAD STOP Insp. values in parentheses Set equal delivery quant. per values 1st version

rpm : 1100

: 211.0...213.0

1000 : (208.0...216.0)

Aneroid pressure h: 1500

Speed

Del.quantity

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

cm3 : 5.00Spread

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 117...125

Testina:

1st rack travel in: 12.60

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1215...1245 Speed

4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 68...76

Testing:

Speed rpm : 100

Minimum rack trave: 6.70

rpm : 275 Speed

Rack travel in mm : 5.10...5.30

Rack travel in mm : 2.00

Speed : 330...390 rpm

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 13.60...13.70

rpm : 700 2nd speed

Rack travel in m: 12.00...12.30

3rd speed rpm : 300

Rack travel in m: 9.80...10.10

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 1100 rpm hPa : 1500 Pressure

: 13.60...13.70 Rack travel mm

Measurement

1/min: 1100 Speed

1st pressure hPa : -

Rack travel in m: 8.90...9.10

2nd pressure hPa : 810

Rack travel in m: 12.40...12.50

3rd pressure hPa : 430

Rack travel in m: 10.00...10.30

START CUT-OUT

1/min: 240 (260) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 700 Del.quantity cm3/: 182.0...188.0 1000 s: (179.0...191.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 96.0...98.0 1000 s: (93.0...101.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.60

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

: 100 rpm

Del.quantity cm3/: 100.0...120.0

1000 s: (96.0...124.0)

Remarks:

Setting and blocking of pointer of

start-of-delivery sensor on cyl. 1

start of delivery

: 2.80...2.90 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (2.75...2.95) Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order : ENA 8,8 a Test sheet : 14.09.90 Edition Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasing Combination no. : 0 402 046 816 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A320RS3253 BASIC SETTING : 0 412 026 738 EP type number Governor Governor design. : RQV250...1100PA956 1st speed rpm: 650 : 0 421 813 857 Governer no. Rack travel in mm : 12.70...12.80 Customer-spec. information Del.quantity cm3/: 18.9...19.1 : ENASA Customer 100 s: (18.6...19.4) : 97 R1 AX Engine cm3 : 0.51st version kW : 221.0 Spread Rated speed : 2200 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 250.0 Rack travel in mm : 7.2...7.4 Test oil Del.quantity cm3/: 2.5...3.1 inlet temp. °C : 38...42 100 s: (2.2...3.4) cm3 : 0.8Overflow valve Spread 100 s: (1.2) : 1 417 413 025 Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 019 GUIDE SLEEVE TRAVEL assembly rpm : 250 1st speed : 1.00...1.40 travel mm Opening. rpm : 350 : 1.70...2.30 : 207...210 pressure, bar 2nd speed travel mm rpm : 700 3rd speed Orifice plate : 4.30...4.90 rpm : 1155 : 0,8 travel mm diameter mm 4th speed : 8.40...8.60 travel mm : 1 680 750 067 rpm : 1250 5th speed Test Lines travel mm : 9.50...9.90 Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00X1.50X1000 Control-lever position x Length mm Degree: -1 rpm : 1170 (A) Injection pump setting values Speed Rack travel in mm : 15.20...17.80 Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values BEGINNING OF DELIVERY 1st version Test pressure, bar: 25...27 Speed rpm : 650

Aneroid pressure h: 900

Del.quantity : 189.0...194.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 103...111 Testina: 1st rack travel in: 11.70 rpm : 1150...1160 Speed 2nd rack travel in: 4.00 rpm : 1240...1270 Speed 4th rack travel in: 1350 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 70...78 Testing: Speed rpm : 100 Minimum rack trave: 7.50 rpm : 250 Rack travel in mm : 5.90...6.10 CONSTANT REGULATION rpm : 250...400 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : 900 : 12.70...12.80 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.70...11.00 2nd pressure hPa : 670 Rack travel in m: 12.20...12.30 3rd pressure hPa : 530 Rack travel in m: 11.40...11.60 START CUT-OUT 1/min: 170 (190) Speed FUEL DELIVERY CHARACTERISTICS

Aneroid pressure h: 900 : 1100 Speed rpm Del.quantity cm3/: 194.0...200.0 1000 s: (191.0...203.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 128.0...130.0 1000 s: (125.0...133.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.70 rpm : 1150...1160 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.guantity cm3/: 220.0...240.0 1000 s: (216.0...244.0) Rack travel in mm : 19.50...21.00

LOW IDLE
Speed rpm

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

:

J07

1st version

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 9,6 y : 20.07.90 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 046 817

Injection pump

Pump designation: PES6P110A720RS3104

EP type number : 0 412 016 712

Governor

Governor design. : RQV300...1150PA850-5

: 0 421 813 871 Governer no.

Customer-spec. information

Customer : KHD

Engine : BF6L513R

1st version kW : 177.0 : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

**308** 

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm

: 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 13.40...13.50

Del.quantity cm3/: 15.1...15.3

100 s: (14.8...15.6)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 300.0 Rack travel in mm : 7.9...8.1 Del.guantity cm3/: 1.6...2.2

100 s: (1.3...2.4)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed : 2.10...2.50 travel mm

rpm : 450 2nd speed

: 3.40...4.00 travel mm

: 700 3rd speed rpm

5.10...5.70 travel mm

: 1190 4th speed rpm

: 8.90...9.10 travel mm

rpm : 1300 5th speed

: 10.00...10.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1160 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed Aneroid pressure h: 900

Del.quantity 1000 : 151.0...153.0

: (148.0...156.0)

Spread cm3 : 4.00 1000 : (7.50)

RATED SPEED

1st version

Control Lever

position degrees: 119...127

Testing:

1st rack travel in: 12.40

rpm : 1190...1200 Speed

2nd rack travel in: 4.00

rpm : 1310...1340 Speed

4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 89...97

Testing:

: 100 Speed rpm

Minimum rack trave: 9.40 Speed rpm : 300

Rack travel in mm : 7.90...8.10

CONSTANT REGULATION

rpm : 320...520 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 450 Speed rpm hPa : 900 Pressure

Rack travel mm : 13.40...13.50

Measurement

Speed 1/min: 450

1st pressure hPa : -

Rack travel in m: 12.40...12.60 2nd pressure hPa : 510 Rack travel in m: 13.20...13.30

3rd pressure hPa : 410

Rack travel in m: 12.70...12.90

START CUT-OUT

Speed 1/min : 250 (270)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm : 600 Speed

Del.quantity cm3/: 153.0...157.0 1000 s: (151.0...159.0)

Aneroid pressure h: -

rpm : 450 Speed

Del.quantity cm3/: 123.0...125.0

1000 s: (120.0...128.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.40

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 170.0...200.0

1000 s: (166.0...204.0)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**APPLICATION** 

Combine-harvester

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BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 10,0 w : 06.07.90 Edition : 15.3.90 Replaces : ISO-4113 Test oil Combination no. : 0 402 075 700 Injection pump Pump designation : PES5P110A720LS3218 : 0 412 015 702 EP type number Governor : RSV350...1100P0A487-Governor design. : 0 421 833 314 Governer no. Customer-spec. information : MERCEDES-BENZ Customer : 0M449 Engine : 140.0 1st version kW : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 0 681 343 009 assembly Opening : 172...175 pressure, bar Test lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40 : (4.25...4.45) Rack travel in mm : 9.00...12.00 Firing order : 1-3-5-4-2 : 0-72-144-216-288 Phasing : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 5 BASIC SETTING rpm: 10801st speed Rack travel in mm : 10.80...10.90 Del.guantity cm3/: 13.5...13.7 100 s: (13.2...13.9) cm3 : 0.4Spread 100 s: (0.8) rpm : 350.02nd speed Rack travel in mm : 6.3...6.7 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.0) Spread cm3 : 0.4100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : ?FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1080 Speed : 135.0...137.0 Del.quantity 1000 : (132.5...139.5) : 4.00 Spread cm3 1000 : (8.00) RATED SPEED 1st version Control lever position degrees: 93...101

Testing:

1st rack travel in: 9.80

rpm : 1130...1140 Speed

2nd rack travel in: 4.00

Speed rpm : 1190...1220 4th rack travel in: 1250

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control Lever

position degrees: 70...78

Setting point w/out bumper spring

rpm : 350 Speed Rack travel in mm: 6.5

Speed rpm : 350 Rack travel in mm : 6.30...6.70

Rack travel in mm : 2.00

Speed rpm : 400...467

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

: 600 Speed rom

Del.quantity cm3/: 111.0...115.0

1000 s: (108.0...118.0)

cm3 : 6.00Spread

1000 s: (9.00)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.80

rpm : 1130...1140 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 140.0...160.0

1000 s: (136.0...164.0)

Remarks:

J11

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,4 L21 Edition : 31.07.90

Replaces : -

Test oil : 150-4113

Combination no. : 0 402 076 053A

Injection pump

Pump designation : PES6P110A820LS442-1

EP type number : 0 412 016 063

Governor

Governor design. : RSV350...1100P0A485

Governer no. : 0 421 833 168

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM 407

1st version kW : 147.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 10.5...10.7

100 s: (10.2...10.9)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 350.0 Rack travel in mm : 7.8...8.0

Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.2)

Spread cm3: 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 rpm : 1250

Speed Lbu : 1520

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1100

Del.quantity : 105.0...107.0

1000 : (102.5...109.5)

Spread cm3 : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 47...55

Testing:

1st rack travel in: 9.70

Speed rpm : 1140...1150

2nd rack travel in: 4.00

Speed rpm : 1220...1250

4th rack travel in: 1350 rpm : 0.30...1.40 Speed

LOW IDLE 1 Control Lever

position degrees: 24...32

Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm : 7.9 speed rpm : 350 Rack travel in mm : 7.80...8.00 Rack travel in mm : 2.00 Speed

rpm : 435...495 Speed

SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600 Del.quantity cm3/ : 92.0...96.0 1000 s: (89.0...99.0)

Spread cm3 : 6.001000 s: (9.00)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.70

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0

1000 s: (136.0...164.0)

Remarks:

: 4.00...4.10 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.95...4.15) Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3 Note remarks : MB 11,4 a 4 Test sheet : 31.07.90 Edition Replaces : 0-60-120-180-240-300 : ISO-4113 Phasing Test oil Tolerance + - ° : 0.50 (0.75) Combination no. : 0 402 076 718A Time to cyl. no. : 6 Injection pump Pump designation : PES6P120A820LS3112-1 : 0 412 026 716 BASIC SETTING EP type number Governor rpm: 1100 Governor design. : RSV350...1100P0A500. 1st speed : 0 421 833 169 Governer no. Rack travel in mm : 11.10...11.20 Customer-spec. information Del.quantity cm3/: 16.6...16.8 Customer : MERCEDES-BENZ 100 s: (16.3...17.1) : 0M407A Engine cm3 : 0.5: 200.0 1st version kW Spread Rated speed : 2200 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0 Rack travel in mm : 4.7...4.9 Test oil Del.quantity cm3/: 1.6...2.2 inlet temp. °C : 38...42 100 s: (1.3...2.5) cm3 : 0.8Overflow valve Spread 100 s: (1.2) : 1 417 413 025 GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Degree: -3 rpm : 800 Test nozzle holder : 1 688 901 019 assembly Rack travel in mm : 0.30...0.70 Opening pressure, bar : 207...210 Governor spring pre-tension Click setting x : ? Orifice plate FULL LOAD DELIV. AT FULL LOAD STOP : 0,8 diameter mm 1st version Test lines : 1 680 750 067 Speed rpm : 1100 Aneroid pressure h: 700 Del.quantity : 166.0...168.0 Outside diameter 1000 : (163.0...171.0) x Wall thickness : 6.00x1.50x1000 Spread cm3 : 5.00x Length mm 1000 : (9.00) (A) Injection pump setting values Insp. values in parentheses RATED SPEED Set equal delivery quant. 1st version per values Control lever position degrees: 44...52 BEGINNING OF DELIVERY

Testing:

Test pressure, bar: 25...27

1st rack travel in: 10.10 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rpm : 1220...1250 Speed 4th rack travel in: 1350 rom : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 21...29 Setting point w/out bumper spring : 350 Speed rpm Rack travel in mm: 4.8 : 350 Speed man Rack travel in mm : 4.70...4.90 Rack travel in mm: 2.00 Speed rom : 420...467 TORQUE CONTROL Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 11.10...11.20 rpm : 600 3rd speed Rack travel in m: 11.40...11.60 Aneroid/Altitude Compensator Test 1st version Settina : 500 Speed rom hPa : 700 Pressure Rack travel mm : 11.40...11.60 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.50...10.60 2nd pressure hPa : 500 Rack travel in m: 11.60...11.70 3rd pressure hPa : 400 Rack travel in m: 10.70...10.90 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 600 Speed rpm Del.quantity cm3/: 168.0...174.0 1000 s: (165.0...177.0) cm3 : 7.50Spread 1000 s: (12.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 143.0...145.0 1000 s: (140.0...148.0)

Spread cm3 : 7.50 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 150.0...170.0

1000 s: (146.0...174.0)

Remarks:

**APPLICATION** 

Generator

: 3.55...3.65 : (3.50...3.70) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 10.50 Note remarks : 1-5-3-6-2-4 Firing order : DEE 7,6 y 1 : 08.08.90 Test sheet Edition : 8.6.90 Replaces : 0-60-120-180-240-300 : ISO-4113 Phasing Test oil Combination no. : 0 402 076 722 : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A720RS3203 : 0 412 026 728 BASIC SETTING EP type number Governor Governor design. : RSV400...1100P2A534. rpm: 1100 1st speed : D 421 833 275 Governer no. Rack travel in mm : 12.50...12.60 Customer-spec. information Del.quantity cm3/: 16.8...17.0 Customer : JOHN DEFRE : 6076 HF 100 s: (16.6...17.2) Engine : 205.0 cm3 : 0.41st version kW Spread Rated speed : 2200 100 s: (0.6) TEST BENCH REQUIREMENTS rpm : 400.02nd speed Rack travel in mm : 5.2...5.4 Test oil Del.quantity cm3/ : 2.0...2.4 inlet temp. °C : 38...42 100 s: (1.8...2.6) cm3 : 0.6Overflow valve Spread 100 s: (0.8) : 1 457 413 010 GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Degree: -3 Test nozzle holder : 1 688 901 101 rpm : 800 assembly Rack travel in mm : 0.30...0.70 Opening | : 207...210 Governor spring pre-tension pressure, bar Click setting x : 2.50Orifice plate FULL LOAD DELIV. AT FULL LOAD STOP : 0,6 diameter mm 1st version : 1 680 750 015 rpm : 1100Speed Test lines Aneroid pressure h: 1200 : 168.0...170.0 Del.quantity Outside diameter 1000 : (166.0...172.0) x Wall thickness : 6.00X3.00X600 cm3 : 4.00 Spread x Length mm 1000 : (6.50) (A) Injection pump setting values Insp. values in parentheses RATED SPEED Set equal delivery quant. 1st version per values \_\_\_\_ Control lever BEGINNING OF DELIVERY position degrees: 36...44 Test pressure, bar: 27...29

Testing:

1st rack travel in: 11.50 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 Speed rpm: 1185...1195 3rd rack travel in: 4.00 Speed rpm : 1185...1215 4th rack travel in: 1300 rpm : 0.30...1.40 Speed LOW IDLE 1 Control Lever position degrees: 12...20 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm: 4.8 Testing: Speed rpm : 100 Minimum rack trave: 19.00 rpm Speed : 400 Rack travel in mm : 5.20...5.40 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 12.50...12.60 : 750 2nd speed rpm Rack travel in m: 13.00...13.20 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rom Pressure hPa : -: 10.30...10.50 Rack travel mm Measurement Speed 1/min: 500 1st pressure hPa : 585 Rack travel in m: 11.10...11.20 2nd pressure hPa : 770 Rack travel in m: 12.30...12.70 3rd pressure hPa : 1200 Rack travel in m: 13.00...13.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 750 Speed rom Del.quantity cm3/: 174.5...178.5

1000 s: (172.5...180.5)

: 800

Del.quantity cm3/: 117.5...121.5 1000 s: (114.5...124.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.50 rpm : 1140...1150 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 90.0...110.0 1000 s: (85.0...115.0) Rack travel in mm : 20.00...21.00 LOW IDLE rpm : 400 Speed Rack travel in mm : 5.20...5.40 Del.quantity cm3/ : 20.0...24.0 1000 s: (18.0...26.0) Spread cm3 : 6.001000 s: (8.00) Remarks:

: JOHN DEERE # RE32035

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

Speed

Aneroid pressure h: -

rom

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : DEE 7,7 g : 05.10.90 Edition : 2.5.90 Replaces Test oil : ISO-4113

Combination no. : 0 402 076 733

Injection pump

Pump designation : PES6P110A720RS3224 : 0 412 016 726 EP type number

Governor

: RSV475...1050P2A534-Governor design.

: 0 421 833 313 Governer no.

Customer-spec. information : JOHN DEERE Customer

Engine : 6101 AT 001

: 170.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x3.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 27...29

: 3.35...3.45 : (3.30...3.50) Prestroke mm

Rack travel in mm : 10.50

: 1-5- 3- 6- 2- 4 Firina order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 15.8...16.0

100 s: (15.6...16.2)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 475.0 2nd speed

Rack travel in mm : 6.0...6.2 Del.quantity cm3/: 1.0...1.4

100 s: (0.8...1.7)

cm3 : 0.6Spread 100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 900

: 158.0...160.0 Del.quantity 1000 : (156.0...162.0)

: 4.00 cm3

Spread 1000 : (6.50)

RATED SPEED

1st version Control lever

position degrees: 36...44

Testina:

1st rack travel in: 12.20

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1135...1145 Speed

3rd rack travel in: 4.00

rpm : 1160...1190 Speed

4th rack travel in: 1250

rpm : 0.30...1.40Speed

LOW IDLE 1

Control lever

position degrees: 15...23

Setting point w/out bumper soring

rpm : 475

Rack travel in mm: 5.6

Testing:

: 100 Speed rom

Minimum rack trave: 19.00

Speed : 475 rom

Rack travel in mm : 6.00...6.20

Aneroid/Altitude

Compensator Test

1st version

Settina

: 500 Speed rom

hPa : 900 Pressure

Rack travel mm : 13.20...13.30

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 11.10...11.30

2nd pressure hPa : 335

Rack travel in m: 12.80...12.90 3rd pressure hPa : 185

Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 120.0...124.0 1000 s: (117.0...127.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20

rpm : 1090...1100 Speed

J19

## STARTING FUEL DELIVERY

: 100 Speed mar

Del.quantity cm3/: 125.0...145.0 1000 s: (120.0...150.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

: 475 Speed rpm

Rack travel in mm : 6.00...6.20

Del.guantity cm3/: 10.5...14.5

1000 s: (8.0...17.0)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE39856

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle

after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: DEE 7,6 g 9 : 08.08.90 Test sheet Edition : 2.5.90 Replaces

Test oil : ISO-4113

Combination no. : 0 402 076 737

Injection pump

Pump designation : PES6P110A720RS3083-1

: 9 410 231 027 EP type number

Governor

Governor design. : RSV475...1050P0A455-

: 0 421 833 340 Governer no.

Customer-spec. information

Customer : JOHN DEERE

: 6466AT014 Engine

: 151.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 0 688 901 101 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x3.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 3.45...3.55 : (3.40...3.60) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 11.70...11.80

Del.guantity cm3/: 13.1...13.3

100 s: (12.9...13.5)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 475.0 2nd speed Rack travel in mm : 6.2...6.4 Del.quantity cm3/: 1.1...1.5 100 s: (0.9...1.7)

cm3 : 0.6Spread 100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 6.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

: 131.5...133.5 Del.quantity 1000 : (129.5...135.5)

: 4.00 Spread cm3 : (6.50) 1000

RATED SPEED

1st version Control lever

position degrees: 37...45

Testing:

1st rack travel in: 10.70

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1195...1205 Speed

3rd rack travel in: 4.00

: 1210...1240 Speed rom.

4th rack travel in: 1300

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 23...31

Setting point w/out bumper spring

rpm : 475 Speed Rack travel in mm: 5.8

Testing:

: 100 Speed rpm Minimum rack trave: 19.00 : 475 Speed rpm

Rack travel in mm : 6.20...6.40

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1050 1st speed

Rack travel in m: 11.70...11.80

: 700 2nd speed rpm

Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700 Del.quantity cm3/ : 136.5...140.5 1000 s: (134.5...142.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.70

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 155.0...175.0

1000 s: (150.0...180.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 475

Rack travel in mm : 6.20...6.40

Del.quantity cm3/: 11.0...15.0

1000 s: (9.0...17.0)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE44340

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark 12° cam angle after start of delivery cyl. 1.

APPLICATION

Excavator

## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

: PER 16,3 b Test sheet : 05.10.90 Edition : 2.2.90 Replaces

: ISO-4113 Test oil

Combination no. : 0 402 638 803

Injection pump

Pump designation : PE8P12OA12ORS7141 : 0 412 628 823 EP type number

Governor

Governor design. : RQ750PA871

: 0 421 801 404 Governer no.

Customer-spec. information Customer : PERKINS

Engine : CV8-320 G

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60

: (4.45...4.65)

Rack travel in mm : 9.00...12.00

: 1- 3- 6- 5- 4- 8- 7- 2 Firing order

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 14.40...14.50

Del.quantity cm3/: 33.3...33.5

100 s: (33.0...33.8)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 7.5...7.7 Del.quantity cm3/ : 3.6...4.2

100 s: (3.3...4.5) Spread cm3 : 0.8

100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 333.0...335.0 Del.quantity

1000 : (330.0...338.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control Lever

position degrees: 85...89

Testing:

1st rack travel in: 13.40

rpm : 750...755 Speed 2nd rack travel in: 4.00

rpm : 795...805 Speed

4th rack travel in: 900

rpm : 0.00...1.00Speed

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.40 Speed rpm : 750...755

Remarks:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MB 22,0 b : 31.07.90 Test sheet Edition : 2.2.90 Replaces : ISO-4113 Test oil

: 0 402 640 812 Combination no.

Injection pump

Pump designation : PE12P120A520LS7820

EP type number : 0 412 620 814

Governor

Governor design. : RQV350...1150PA870-4

Governer no. : 0 421 813 717

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM 444 LA

: 736.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.40...4.50 : (4.35...4.55) Prestroke mm

Rack travel in mm : 19.00...21.00 Firing order : 12-1-5-9-8-3-4-11-10-2-6-7

Phasing : 0-45-60-105-120-165-

180-225-240-285-300-

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 14.30...14.40

Del.quantity cm3/: 31.2...31.4

100 s: (30.9...31.7)

cm3 : 0.6Spread

100 s: (1.0)

rpm : 350.02nd speed Rack travel in mm: 5.0...6.6

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 350 : 1.30...1.80 travel mm

2nd speed rpm : 600

: 3.30...3.80 travel mm

: 960 3rd speed rom

: 5.30...5.80 travel mm

rpm : 1206

4th speed

: 7.90...8.40 travel mm : 1291

5th speed rpm : 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1275 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1150 Speed Aneroid pressure h: 1800 : 312.0...314.0 Del.quantity 1000 : (309.0...317.0) : 6.00 Spread cm3 1000 : (10.00) RATED SPEED 1st version Control lever position degrees: 113...121 Testina: 1st rack travel in: 13.30 rpm : 1190...1200 Speed 2nd rack travel in: 4.00 Speed : 1270...1300 rpm 4th rack travel in: 1350 : 0.00...1.00 Speed rom LOW IDLE 1 Control lever position degrees: 62...70 Testina: : 250 Speed rom Minimum rack trave: 7.00 : 350 rpm Rack travel in mm : 5.00...5.60 CONSTANT REGULATION rpm : 350...600 Speed Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : -Pressure : 7.80...8.10 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 300 Rack travel in m: 9.20...9.30 2nd pressure hPa : 1100 Rack travel in m: 13.40...13.70 START CUT-OUT 1/min: 310 (330) Speed

1st version Aneroid pressure h: 1800 : 750 Speed rpm Del.quantity cm3/: 303.0...313.0 1000 s: (300.0...316.0) cm3 : 10.00Spread 1000 s: (15.0) Aneroid pressure h: 1800 Speed rpm : 1150 Del.quantity cm3/ : 240.0...243.0 \* 1000 s: (237.0...246.0) : 10.00 cm3 Spread 1000 s: (15.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 124.0...126.0 1000 s: (121.0...129.0) cm3 : 10.00 Spread 1000 s: (15.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.30 rpm : 1190...1200 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 330.0...350.0 1000 s: (326.0...354.0) Remarks:

 $\star$  = Set at reduced-delivery stop.

FUEL DELIVERY CHARACTERISTICS

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.50...4.60 : (4.45...4.65) Rack travel in mm : 9.00...12.00 Note remarks : 12- 1- 5- 9- 8- 3-Firing order 4- 11- 10- 2- 6- 7 : MAN 21.0 b2 Test sheet Edition : 14.09.90 : 17.5.90 Replaces : ISO-4113 Test oil : 0-45-60-105-120-165-Phasina 180-225-240-285-300-: 0 402 640 815 Combination no. : 345 Phasina : 0.50 (0.75) Tolerance + - ° Injection pump Pump designation : PE12P12OA520LS7824 : 0 412 620 816 Time to cyl. 10. : 12 EP type number Governor Governor design. : RQV300...1150PA902-4 BASIC SETTING : 0 421 813 870 Governer no. rpm: 1150 1st speed Customer-spec. information Rack travel in mm : 13.60...13.70 : MAN Customer Del.quantity cm3/: 30.1...30.3 : D2842LYE Engine 100 s: (29.8...30.6) : 735.0 1st version kW : 2300 Rated speed cm3 : 0.5Spread TEST BENCH REQUIREMENTS 100 s: (0.9) Test oil 2nd speed rpm : 500.0 Rack travel in mm : 9.1...9.3 inlet temp. °C : 38...42 Del.quantity cm3/: 14.9...15.1 Overflow valve 100 s: (14.6...15.4) : 1 417 413 025 Spread cm3 : 0.8100 s: (1.2) Inlet press., bar: 1.50 3rd speed rpm : 300
Rack travel in mm : 7.20...7.40
Del.quantity cm3/ : 5.2...6.0 \*
100 s: (-) Test nozzle holder : 1 688 901 019 assembly Spread cm3 : -Openina 100 s: (-) : 207...210 pressure, bar Orifice plate (B) Setting of injection pump diameter mm : 0,8 with governor GUIDE SLEEVE TRAVEL rpm : 300Test lines : 1 680 750 067 1st speed : 1.20...1.60 travel mm rpm : 450 2nd speed Outside diameter travel mm : 2.90...3.50 x Wall thickness rpm ; 750 : 6.00X1.50X1000 3rd speed x Length mm travel mm : 5.60...6.00 rpm : 1150 (A) Injection pump setting values 4th speed 9.50...9.70 Insp. values in parentheses travel mm : 1400 5th speed Set equal delivery quant. rpm : 13.00...14.00 per values travel mm

GUIDE SLEEVE POSITION

Control-lever position

De ree: -1

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

rpm : 1200 Rack travel in mm : 15.20...17.80 1/min : 220 (240) Speed FULL LOAD DELIV. AT FULL LOAD STOP FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1150 1st version Speed Aneroid pressure h: 1300 Aneroid pressure h: -Del.quantity : 301.0...306.0) Speed rpm : 500 Del.quantity cm3/ : 149.0...151.0 1000 s: (146.0...154.0) cm3 : 5.00 1000 : (9.00) Spread cm3 : 8.00 1000 s: (12.0) Spread RATED SPEED BREAKAWAY 1st version Control lever 1st version position degrees: 118...126 1mm rack travel less than Testina: full load rack tr: 12.60 1st rack travel in: 12.60 rpm : 1190...1200 rpm : 1190...1200 Speed Speed 2nd rack travel in: 4.00 rpm : 1290...1320 STARTING FUEL DELIVERY Speed 4th rack travel in: 1400 rpm : 0.00...1.00 Speed Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 \* 1000 s: (-) LOW IDLE 1 Control Lever position degrees: 79...87 rpm : 100Del.quantity cm3/:-Testing: 1000 s: (-) Speed rpm : 100 Rack travel in mm : 17.50 Minimum rack trave: 8.90 Speed rpm : 300 Rack travel in mm : 7.30...7.50 HIGH IDLE Rack travel in mm : 2.00 Speed : 470...530 1st version rom Aneroid pressure h: rpm : 500 Aneroid/Altitude Rack travel in mm : <7.00 Compensator Test Del.quantity cm3/: - \*\* 1000 s: (-) 1st version 2nd version Setting : 500 Aneroid pressure h: -Speed rpm hPa : 1300 rpm : 500 Pressure Rack travel in mm : < 7.50 : 13.60...13.70 Rack travel name Del.quantity cm3/: < 50.0 1000 s: (-) Measurement 1/min: 500 Speed 3rd version 1st pressure hPa : -Aneroid pressure h: rpm : 500 Rack travel in m: 9.10...9.30 Speed 2nd pressure hPa : 100
Rack travel in m: 9.50...9.60
3rd pressure hPa : 470 Rack travel in mm : 8.40...8.60 Del.quantity cm3/: 125.0 1000 s: (-) Rack travel in m: 12.40...12.80 LOW IDLE START CUT-OUT

Speed rpm : 300
Rack travel in mm : 7.20...7.40
Del.quantity cm3/ : 52.0...60.0 \*
1000 s: (-)

Remarks:

: MAN-NR. 2-7960

\* applies to cylinders 4, 5, 6, 8 ,10 and 12  $^{\circ}$ \*\* applies for cylinders 1, 2, 3, 7, 9 and 11

**APPLICATION** 

Ship

: 4.50...4.60 Prestroke mm BOSCH INJ. PUMP TEST SPECIFICATIONS : (4.45...4.65) Rack travel in mm : 9.00...12.00 Note remarks : 12- 1- 5- 9- 8- 3-Firing order 4- 11- 10- 2- 6- 7 : MAN 21,0 b1 Test sheet : 21.09.90 Edition : 26.6.90 Replaces : ISO-4113 Test oil : 0-45-60-105-120-165-Phasing 180-225-240-285-300-Combination no. : 0 402 640 816 : 345 Phasing : 0.50 (0.75) Tolerance + - ° Injection pump Pump designation : PE12P12OA52OLS7824 Time to cyl. no. : 12 : 0 412 620 816 EP type number Governor Governor design. : RQV250...1150PA902-3 BASIC SETTING : 0 421 813 761 Governer no. rpm: 1150 1st speed Customer-spec. information Rack travel in mm : 12.70...12.80 : MAN Customer Del.quantity cm3/: 24.9...25.1 : D2847 KE Engine 100 s: (24.6...25.4) : 662.0 1st version kW : 2300 Rated speed cm3 : 0.5Spread TEST BENCH REQUIREMENTS 100 s: (0.9) Test oil rpm : 500.0 inlet temp. °C : 38...42 2nd speed Rack travel in mm : 9.4...9.6 Del.quantity cm3/: 14.9...15.1 Overflow valve 100 s: (14.6...15.4) : 1 417 413 025 cm3 : 0.8 Spread 100 s: (1.2) Inlet press., bar: 1.50 rpm : 250 3rd speed Rack travel in mm: 7.30...7.50 Test nozzle holder Del.quantity cm3/ : 5.2...6.0 \* : 1 688 901 019 assembly 100 s: (-) Opening : 207...210 (B) Setting of injection pump pressure, bar with governor Orifice plate GUIDE SLEEVE TRAVEL diameter mm : 0,8 rpm : 250 1st speed : 0.90...1.10 travel mm rpm : 450 Test lines : 1 680 750 067 2nd speed travel mm : 2.90...3.50 rpm : 750 Outside diameter 3rd speed 5.50...5.90 x Wall thickness travel mm 1150 : 6.00x1.50x1000 4th speed rpm : x Length mm : 9.20...9.40 travel mm rpm : 1400 (A) Injection pump setting values 5th speed : 13.00...14.00 Insp. values in parentheses travel mm Set equal delivery quant. per values GUIDE SLEEVE POSITION Control-lever position BEGINNING OF DELIVERY Degree: -1 rpm : 1225

Rack travel in mm : 15.20...17.80

Test pressure, bar: 25...27

FULL LOAD DELIV. AT FULL LOAD STOP FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1150 1st version Speed Aneroid pressure h: 1300 Aneroid pressure h: -: 249.0...251.0 Del.quantity Speed rpm : 500 Del.quantity cm3/: 149.0...151.0 1000 : (246.0...254.0) cm3 : 5.00 1000 : (9.00) 1000 s: (146.0...154.0) Spread cm3 : 8.00 Spread 1000 s: (12.0) RATED SPEED BREAKAWAY 1st version Control lever position degrees: 117...125 1st version 1mm rack travel less than Testing: 1st rack travel in: 11.70 Speed rpm : 1190...1200 full load rack tr: 11.70 rpm : 1190...1200 Speed 2nd rack travel in: 4.00 rpm : 1275...1315 STARTING FUEL DELIVERY Speed 4th rack travel in: 1400 Speed rpm : 0.00...1.00 : 100 Speed rpm Del.quantity cm3/: 100.0...120.0 \* 1000 s: (-) LOW IDLE 1 Control Lever position degrees: 76...84 Speed rpm : 100 Del.quantity cm3/: - \*\* Testing: 1000 s: (-) Speed rpm : 100 Rack travel in mm: 17.50 Minimum rack trave: 8.90 rpm : 250 Rack travel in mm : 7.70...7.90 Rack travel in mm : 2.00 HIGH IDLE 1st version Speed rpm : 430...490 Aneroid pressure h: -Speed rpm : 500 Aneroid/Altitude Rack travel in mm : < 7.50 Compensator Test Del.quantity cm3/: - \*\* 1000 s: (-) 1st version Setting 2nd version : 500 Speed Speed rpm : 500 rom Rack travel in mm : < 8.00 hPa : 1300 Pressure Del.quantity cm3/: < 50.0 1000 s: (-) Rack travel mm : 12.70...12.80 Measurement 1/min: 500 3rd version Speed Speed rpm : 500 Rack travel in mm : 8.60...8.80 1st pressure hPa : -Del.quantity cm3/: 125.0 Rack travel in m: 9.40...9.60 1000 s: (-) 2nd pressure hPa : 100 Rack travel in m: 9.80...9.90 3rd pressure hPa : 400 LOW IDLE Rack travel in m: 11.90...12.30 Speed rpm : 250
Rack travel in mm : 7.30...7.50
Del.quantity cm3/ : 52.0...60.0 \* START CUT-OUT 1/min: 170 (190) 1000 s: (-) Speed

K02

Remarks:

: MAN-NR. 2-7959

\* applies to cylinders 4, 5, 6, 8, 10 and 12 \*\* applies for cylinders 1, 2, 3, 7, 9 and 11

APPLICATION

Ship

Note remarks

: MB 22,0 c : 31.07.90 : 2.2.90 Test sheet Edition Replaces : ISO-4113 Test oil

Combination no. : 0 402 640 817

Injection pump

Pump designation : PE12P12OA52OLS7826

EP type number : 0 412 620 817

Governor

Governor design. : RQV350...1150PA870-4

: 0 421 813 717 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: OM 444 LA Engine

: 736.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.40...4.50 Prestroke mm

: (4.35...4.55)

Rack travel in mm : 19.00...21.00

: 12- 1- 5- 9- 8- 3-4- 11- 10- 2- 6- 7 Firing order

: 0-45-60-105-120-165-Phasina

180-225-240-285-300-

345

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 15.20...15.30

Del.guantity cm3/: 31.2...31.4

100 s: (30.9...31.7)

Spread cm3 : 0.6

100 s: (1.0)

rpm : 350.0 2nd speed

Rack travel in mm : 5.3...5.9 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

1.30...1.80 travel mm

rpm : 600 2nd speed

: 3.30...3.80 travel mm : 960

3rd speed rpm

: 5.30...5.80 travel mm

: 1206 4th speed rpm

: 7.90...8.40 travel mm

: 1291 5th speed rpm

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1275 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1150 Speed Aneroid pressure h: 1800 : 312.0...314.0 Del.quantity 1000 : (309.0...317.0) cm3 : 6.00Spread 1000 : (10.00) RATED SPEED 1st version Control Lever position degrees: 113...121 Testing: 1st rack travel in: 14.20 rpm : 1190...1200 Speed 2nd rack travel in: 4.00 rpm : 1270...1300 Speed 4th rack travel in: 1350 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 62...70 Testing: Speed rpm Minimum rack trave: 7.30 : 350 Speed rpm Rack travel in mm : 5.30...5.90 CONSTANT REGULATION rpm : 350...600 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 mar Pressure hPa : -: 8.20...8.50 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 300 Rack travel in m: 9.60...9.70 2nd pressure hPa : 1100 Rack travel in m: 13.80...14.10 START CUT-OUT 1/min: 310 (330) Speed

FUEL DELIVERY CHARACTERISTICS

K05

1st version Aneroid pressure h: 1800 : 750 Speed rpm Del.quantity cm3/: 303.0...313.0 1000 s: (300.0...316.0) cm3 : 10.00 Spread 1000 s: (15.0) Aneroid pressure h: 1800 : 1150 Speed rpm Del.quantity cm3/: 240.0...243.0 \* 1000 s: (237.0...246.0) cm3 : 10.00 Spread 1000 s: (15.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 124.0...126.0 1000 s: (121.0...129.0) cm3 : 10.00Spread 1000 s: (15.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 14.20 Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 330.0...350.0 1000 s: (326.0...354.0)

Remarks:

•

: 4.50...4.60 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (4.45...4.65) Rack travel in mm : 9.00...12.00 Note remarks : 12- 1- 5- 9- 8- 3-4- 11- 10- 2- 6- 7 Firing order : MAN 21,0 e1 Test sheet : 14.09.90 Edition : 17.5.90 Replaces : ISO-4113 Test oil : 0-45-60-105-120-165-Phasing Combination no. 180-225-240-285-300-: 0 402 640 818 Phasing : 345 Tolerance + - ° : 0.50 (0.75) Injection pump Pump designation : PE12P120A520LS7829 : 0 412 620 821 Time to cyl. no. : 12 EP type number Governor Governor design. : RQV300...1150PA943-1 BASIC SETTING : 0 421 813 869 Governer no. 1st speed rpm: 1150 Customer-spec. information Rack travel in mm : 13.80...13.90 : MAN Customer Del.quantity cm3/: 30.4...30.6 Engine : D2842LZE 100 s: (30.1...30.9) : 809.0 1st version kW Rated speed : 2300 Spread cm3 : 0.5TEST BENCH REQUIREMENTS 100 s: (0.9) Test oil rpm : 500 inlet temp. °C : 38...42 2nd speed Rack travel in mm : 9.10...9.30 Del.quantity cm3/: 14.9...15.1 100 s: (14.6...15.4) Overflow valve : 1 417 413 025 cm3 : 0.8Spread 100 s: (1.2) Inlet press., bar: 1.50 3rd speed rpm : 300 Rack travel in mm : 7.30...7.50 Test nozzle holder Del.quantity cm3/ : 5.2...6.0 \* : 1 688 901 019 assembly 100 s: (-) Opening (B) Setting of injection pump : 207...210 pressure, bar with governor Orifice plate GUIDE SLEEVE TRAVEL diameter mm : 0,8 1st speed rpm : 300 : 1.20...1.60 travel mm Test lines : 1 680 750 067 rpm : 450 2nd speed : 2.90...3.50 travel mm Outside diameter 3rd speed rpm : 750 5.70...6.10 x Wall thickness travel mm 1150 : 6.00x1.50x1000 4th speed x Length mm rpm 9.50...9.70 travel mm rpm : 1400 (A) Injection pump setting values 5th speed : 13.00...14.00 Insp. values in parentheses travel mm Set equal delivery quant. per values \_\_\_ GUIDE SLEEVE POSITION Control-lever position BEGINNING OF DELIVERY Degree: -1

rpm : 1225

Rack travel in mm : 15.20...17.80

Speed

Test pressure, bar: 25...27

FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1150 Speed Aneroid pressure h: 1300 : 304.0...306.0 Del.quantity 1000 : (301.0...309.0) Speed cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 118...126 Testing: 1st rack travel in: 12.80 rpm : 1190...1200 Speed 2nd rack travel in: 4.00 Speed rpm : 1300...1330 Speed 4th rack travel in: 1400 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 79...87 Speed Testing: : 100 Speed rpm Minimum rack trave: 8.90 : 300 rpm Rack travel in mm : 7.30...7.50 CONSTANT REGULATION rpm : 280...410 Speed Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 Speed rpm hPa : 1300 Pressure : 13.80...13.90 Rack travel mm Measurement 1/min: 500 Speed Speed 1st pressure hPa : -Rack travel in m: 9.10...9.30 2nd pressure hPa : 100 Rack travel in m: 9.50...9.60 3rd pressure hPa : 470 Rack travel in m: 12.40...12.80 START CUT-OUT and 12

1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -: 500 rpm Del.quantity cm3/: 149.0...151.0 1000 s: (146.0...154.0) cm3 : 8.00Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.80 rpm : 1190...1200 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 \* 1000 s: (-) rpm : 100 Del.quantity cm3/: - \*\* 1000 s: (-) Rack travel in mm: 17.50 HIGH IDLE 1st version rpm : 500 Rack travel in mm : < 7.00 Del.quantity cm3/: - \*\* 1000 s: (-) 2nd version rpm : 500 Rack travel in mm : < 7.50 Del.quantity cm3/: < 50.0 1000 s: (-) 3rd version rpm : 500 Rack travel in mm : 8.50...8.70 Del.quantity cm3/: 1 1000 s: (-) 125.0 Remarks: : MAN-NR. 3-7023 \* applies to cylinders 4, 5, 6, 8, 10 \*\* applies for cylinders 1, 2, 3, 7, 9 and 11
APPLICATION
Ship

Note remarks

: MB 21,9 x 2 Test sheet : 14.09.90 Edition : 1.2.90 Replaces : ISO-4113 Test oil

Combination no. : 0 402 640 819

Injection pump

Pump designation : PE12P12OA32OLS7807-3

: 0 412 620 822 EP type number

Governor

Governor design. : RQV350...1050PA842-6 Governer no. : 0 421 813 853

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM 444 A

: 390.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 9.00...12.00

: 12- 1- 5- 9- 8- 3-4- 11- 10- 2- 6- 7 Firing order

: 0-45-60-105-120-165-Phasing

180-225-240-285-300-

345

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 13.50...13.70

Del.guantity cm3/: 19.9...20.1

100 s: (19.6...20.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.02nd speed Rack travel in mm: 5.4...5.6 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 0.70...1.20 travel mm

2nd speed rpm : 600

travel mm : 3.10...3.60 rpm : 940

3rd speed

: 5.20...5.70 travel mm

: 1105 4th speed rpm

: 6.70...7.20 travel mm

: 1263 5th speed rpm

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1150

Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP	+ Speed 1/min: 600
1st version Speed rpm : 600 Aneroid pressure h: 660 Del.quantity : 199.0201.0 1000 : (196.0204.0) Spread cm3 : 5.00 1000 : (9.00)	1st pressure hPa : 350 Rack travel in m: 11.3011.50 2nd pressure hPa : 500 Rack travel in m: 12.8013.00 3rd pressure hPa : 830 Rack travel in m: 13.7013.80 4th pressure hPa : 1150 Rack travel in m: 13.7013.90
RATED SPEED	5th pressure hPa : - Rack travel in m: 10.4010.60
1st version Control lever position degrees: 107115	Speed 1/min : 270 (290)
Testing: 1st rack travel in: 11.20 Speed rpm : 10901100 2nd rack travel in: 4.00 Speed rpm : 11551185	FUEL DELIVERY CHARACTERISTICS  1st version
4th rack travel in: 1250 Speed rpm : 0.001.00	Aneroid pressure h: 1100 Speed rpm: 1050 Del.quantity cm3/: 170.0174.0
LOW IDLE 1 Control lever position degrees: 6270	1000 s: (167.0177.0)  Spread cm3 : 8.00  1000 s: (12.0)  Aneroid pressure h: 1100
Testing: Speed rpm : 250 Minimum rack trave: 7.10 Speed rpm : 350 Rack travel in mm : 5.405.60	- Speed rpm : 750 - Del.quantity cm3/ : 204.0208.0 - 1000 s: (201.0211.0) - Spread cm3 : 8.00 - 1000 s: (12.0)
CONSTANT REGULATION Speed rpm : 400600	Aneroid pressure h: 1100 Speed rpm: 1050 Del.quantity cm3/: 150.0154.0 1000 s: (147.0157.0)
TORQUE CONTROL Dimension a mm : 1.30 Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 12.2012.40 2nd speed rpm : 975 Rack travel in m: 12.6012.80 3rd speed rpm : 875 Rack travel in m: 13.2013.40 4th speed rpm : 700	Spread cm3: 8.00 1000 s: (12.0) Aneroid pressure h: - Speed rpm: 500 Del.quantity cm3/: 136.0138.0 1000 s: (133.0141.0) Spread cm3: 8.00 1000 s: (12.0)
Rack travel in m: 13.5013.70  Aneroid/Altitude	BREAKAWAY  1st version
Compensator Test	1mm rack travel less than
1st version Setting Speed rpm : 600	full load rack tr: 11.20 Speed rpm: 10901100 STARTING FUEL DELIVERY
Pressure hPa : 660 Rack travel mm : 13.5013.70 Measurement	Speed rpm : 100

K10

Del.quantity cm3/ : 220.0...240.0 1000 s: (216.0...244.0)

Remarks:

#### Note remarks

: MB 22,0 e : 20.07.90 Test sheet Edition : 17.5.90 Replaces : ISO-4113 Test oil

: 0 402 640 820 Combination no.

Injection pump

Pump designation: PE12P120A320LS7814-2

EP type number : 0 412 620 824

Governor

Governor design. : RQ750PA966 : 0 421 801 535 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

Engine : OM 444 LA

1st version kW : 535.0 Rated speed : 1500

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 4.80...4.90 : (4.75...4.95)

Rack travel in mm : 19.00...21.00 Firing order : 12-1-5-9-8-3-

4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-

180-225-240-285-300-

345

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

#### BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.90...15.00

Del.quantity cm3/: 31.6...31.8

100 s: (31.3...32.1)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 4.6...5.2 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

Spread cm3 : 0.6100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 760 1st speed

: 4.30...4.80 travel mm

rpm : 830 2nd speed

: 11.70...12.20 travel mm

3rd speed : 890 rpm

: 13.00...14.00 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 316.0...318.0 Del.quantity

1000 : (313.0...321.0)

: 5.00 cm3 Spread

: (9.00) 1000

RATED SPEED

1st version Control lever position degrees: 76...84

Testing:

1st rack travel in: 13.90 Speed rpm : 755...760 2nd rack travel in: 4.00 rpm : 780...790 Speed

4th rack travel in: ?

rpm : 0.00...1.00 Speed

## BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.90 rpm : 755...760 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0)

Remarks:

Observe VDT-I-420/120

**APPLICATION** 

Generator

Note remarks

Test sheet : MB 22,0 a 1 : 31.07.90 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 640 821

Injection pump

Pump designation : PE12P12OA520LS7814

: 0 412 620 813 EP type number

Governor

Governor design. : RQV350...1050PA870-9

: 0 421 813 873 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: OM 444 LA Engine

: 588.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Opening 1

: 207...210 pressure, bar

Orifice plate

: 0.8 diameter mm

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.80...4.90 Prestroke mm

: (4.75...4.95)

Rack travel in mm : 19.00...21.00 : 12- 1- 5- 9- 8- 3-Firing order

4- 11- 10- 2- 6- 7

: 0-45-60-105-120-165-Phasing

180-225-240-285-300-

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

rpm:6501st speed

Rack travel in mm : 13.00...13.20

Del.guantity cm3/: 26.2...26.5

100 s: (25.9...26.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.0 2nd speed

Rack travel in mm : 5.3...5.9 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.30...1.80 travel mm

rpm : 600 2nd speed

travel mm : 3.30...3.80

: 900 3rd speed rpm

: 5.40...5.90 : <u>1</u>100 travel mm

rpm 4th speed

: 7.60...8.10 travel mm

5th speed : 1200 rpm

: 9.60...10.10 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1275

Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP 2nd pressure hPa : 700 Rack travel in m: 11.10...11.30 3rd pressure hPa : 1400 1st version Rack travel in m: 13.20...13.30 4th pressure hPa : 1500 rpm : 650 Speed Aneroid pressure h: 1100 : 262.0...265.0 Rack travel in m: 13.40...13.60 Del.quantity 1000 : (259.0...268.0) 5th pressure hPa : -Rack travel in m: 8.20...8.50 : 5.00 cm3Spread 1000 : (9.00) START CUT-OUT RATED SPEED 1/min: 310 (330) Speed 1st version FUEL DELIVERY CHARACTERISTICS Control lever position degrees: 113...121 Testina: 1st version 1st rack travel in: 11.80 Aneroid pressure h: 1850 rpm : 1090...1100 : 1050 Speed Speed rpm Del.quantity cm3/: 261.0...264.0 1000 s: (258.0...267.0) 2nd rack travel in: 4.00 Speed rpm : 1160...1190 4th rack travel in: 1250 cm3 : 8.00 Spread 1000 s: (12.0) Speed rpm : 0.00...1.00Aneroid pressure h: 1850 : 750 LOW IDLE 1 Speed rpm Del.quantity cm3/: 278.0...282.0 Control lever 1000 s: (275.0...285.0) position degrees: 62...70 Spread cm3 1000 s: (12.0) Testing: Aneroid pressure h: -Speed rpm Minimum rack trave: 7.30 rpm : 500 Speed Del.quantity cm3/: 130.0...132.0 rpm : 350 Rack travel in mm : 5.30...5.90 1000 s: (127.0...135.0) cm3 : 8.00Spread 1000 s: (12.0) CONSTANT REGULATION rpm : 350...600 Speed BREAKAWAY TORQUE CONTROL Dimension a mm : 0.90 Torque control curve - 1st version 1st version rpm : 1050 1mm rack travel less than 1st speed Rack travel in m: 12.80...12.90 rpm : 850 full load rack tr: 11.80 2nd speed Rack travel in m: 13.70...13.90 rpm : 1090...1100 Speed Aneroid/Altitude STARTING FUEL DELIVERY Compensator Test : 100 Speed rpm Del.quantity cm3/: 260.0...280.0 1st version 1000 s: (256.0...284.0) Setting : 650 Speed rpm hPa : 1100 Remarks: Pressure Rack travel mm : 13.00...13.20 Measurement 1/min: 650 Speed

1st pressure hPa : 500

Rack travel in m: 9.50...9.70

Note remarks

: MB 22,0 e 1 : 17.09.90 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 0 402 640 822 Combination no.

Injection pump

Pump designation : PE12P12OA32OLS7814-2

: 0 412 620 824 EP type number

Governor

Governor design. : RQ750PA966-1 : 0 421 801 550 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: OM 444 LA Engine

1st version kW : 539.0 : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.80...4.90 Prestroke mm

: (4.75...4.95)

Rack travel in mm : 19.00...21.00 Firing order : 12-1-5-9-8-3-4-11-10-2-6-7

: 0-45-60-105-120-165-Phasing

180-225-240-285-300-

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 14.50...14.60

Del.guantity cm3/: 29.4...29.6

100 s: (29.1...29.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.6...5.2

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

Spread 100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 935 1st speed

: 4.60...5.10 travel mm

rpm : 1070 2nd speed

: 13.70...14.00 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

: 294.0...296.0 Del.quantity

1000 : (291.0...299.0)

: 5.00 Spread cm3

: (9.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 77...85

Testing:

1st rack travel in: 13.50 Speed rpm: 905...910
2nd rack travel in: 4.00
Speed rpm: 940...950
4th rack travel in: 1000

rpm : 0.00...1.00Speed

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 13.50 rpm : 905...910 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0)

Remarks:

Observe VDT-I-420/120

**APPLICATION** 

Generator

Note remarks

: MB 21,9 u 1 Test sheet Edition : 17.09.90

Replaces

: ISO-4113 Test oil

: 0 402 640 823 Combination no.

Injection pump

Pump designation : PE12P12OA32OLS7805

EP type number : 0 412 620 802

Governor

Governor design. : RQV350...1050PA781-1

: 0 421 813 890 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: OM 444 LA Engine

: 485.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...160

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 9.00...12.00

: 12- 1- 5- 9- 8- 3-4- 11- 10- 2- 6- 7 Firing order

: 0-45-60-105-120-165-Phasing

180-225-240-285-300-

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 21.1...21.3

100 s: (20.8...21.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.02nd speed

Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3) cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.40...1.90 travel mm

2nd speed rpm : 481

: 3.00...3.50 travel mm

: 1107 3rd speed rpm

7.40...7.90 travel mm

1420 4th speed rom

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1180

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 1050 Speed Aneroid pressure h: 1100 Del.quantity : 211.0...213.0 Del.quantity : 211.0...216.0) : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 94...102 Testina: 1st rack travel in: 12.90 rpm : 1090...1110 Speed 2nd rack travel in: 4.00 rpm : 1220...1250 Speed 4th rack travel in: 1300 rpm : 0.00...1.50Speed LOW IDLE 1 Control lever position degrees: 44...52 Testing: Speed : 250 rpm Minimum rack trave: 6.80 rpm : 350 Rack travel in mm : 5.20...5.80 CONSTANT REGULATION rpm : 400...600 Speed Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : -Rack travel mm : 11.00...11.30 Measurement 1/min: 500 Speed 1st pressure hPa : 350 Rack travel in m: 11.70...11.90 2nd pressure hPa : 500 Rack travel in m: 12.90...13.10

1st version Aneroid pressure h: 1100 rpm : 600 Speed Del.quantity cm3/: 205.0...209.0 1000 s: (202.0...212.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm\_ : 500 Speed Del.quantity cm3/: 141.0...143.0 1000 s: (138.0...146.0) cm3 : 8.00 Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.90 rpm : 1090...1110 Speed STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 210.0...230.0
1000 s: (206.0...234.0)

Remarks:

lidrks:

Speed

START CUT-OUT

1/min: 270 (290)

FUEL DELIVERY CHARACTERISTICS

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 3.60...3.70 : (3.55...3.75) Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order Test sheet : VOL 16,0 c1 : 31.08.90 Edition : 16.2.90 Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasing : 0.30 (0.75) Combination no. : 0 402 646 877 Tolerance + - ° Injection pump Time to cyl. no. : 1 Pump designation : PE6P130A720RS7122-1 BASIC SETTING EP type number : 0 412 636 812 Governor Governor design. : RQV225...930PA922 Governer no. : 0 421 813 763 rom: 7001st speed Rack travel in mm : 13.50...13.60 Customer-spec. information Del.quantity cm3/: 30.0...30.3 Customer : VOLVO-TRUCK : TD162 FL, FJ, 100 s: (29.7...30.7) Engine cm3 : 0.6: 331.0 Spread 1st version kW : 1860 Rated speed 100 s: (1.0) TEST BENCH REQUIREMENTS 2nd speed rpm : 250.0Rack travel in mm: 4.9...5.1 Test oil Del.quantity cm3/ : 2.5...3.0 inlet temp. °C : 38...42 100 s: (2.3...3.3) cm3 : 0.5Overflow valve Spread : 1 417 413 025 100 s: (0.8) (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test pozzle holder : 1 688 901 019 GUIDE SLEEVE TRAVEL assembly 1st speed rpm : 250 1.00...1.40 travel mm Opening | 350 pressure, bar : 207...210 2nd speed rpm : 2.10...2.70 rpm : 700 travel mm Orifice plate 3rd speed diameter mm : 0,8 travel mm : 5.60...6.20 rpm : 975 4th speed : 8.20...8.40 travel mm Test lines : 1 680 750 067 5th speed rpm : 1090 : 9.50...9.90 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00X1.50X1000 Control-lever position x Length mm Degree: -1 rpm : 1100 (A) Injection pump setting values Speed Rack travel in mm : 7.70...10.30 Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values

1st version

Speed

rpm : 700

Aneroid pressure h: 1200

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 300.5...303.5

1000 : (297.0...307.0)

: 6.00 Spread cm31000 : (10.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 12.50 Speed rpm : 970...980 2nd rack travel in: 4.00

Speed rpm: 1090...1120 4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 60...68

Testing:

rpm : 100 Speed Minimum rack trave: 6.50 rpm

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

rpm : 250...450 Speed

Aneroid/Altitude Compensator Test

1st version

Settina

: 500 Speed rpm hPa : 1200 Pressure

Rack travel mm : 13.50...13.60

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 9.50...9.70

2nd pressure hPa : 110

Rack travel in m: 9.80...9.90

3rd pressure hPa : 720

Rack travel in m: 12.80...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 180.0...183.0 1000 s: (176.5...183.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.50 rpm : 970...980 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 120.0...140.0 1000 s: (116.0...144.0)

Rack travel in mm : 9.50...9.70

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 4.90...5.10 Del.quantity cm3/: 25.5...30.5

1000 s: (23.0...33.0)

cm3 : 5.00 Spread

1000 s: (8.00)

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : DAF 11,7 k6 Test sheet : 03.08.90 Edition Replaces : ISO-4113 Test oil : 0 402 646 894 Combination no. Injection pump Pump designation : PE6P12OA32ORS7194 : 0 412 626 834 EP type number Governor Governor design. : RQ250/1000PA936 : 0 421 801 507 Governer no. Customer-spec. information Customer : DAF : WS 295 Engine : 295.0 1st version kW : 2000 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 : 1 680 750 075 Test lines Outside diameter x Wall thickness : 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 5.20...5.30 : (5.15...5.35) Prestroke mm Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order ·: 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 850 1st speed Rack travel in mm : 13.70...13.80 Del.quantity cm3/: 24.5...24.7 100 s: (24.2...25.0) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 250.0 Rack travel in mm : 7.6...8.0 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) cm3 : 0.8Spread 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 550 Speed Rack travel in mm : 15.20...16.40 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 850 Speed Aneroid pressure h: 1000 : 245.0...247.0 Del.quantity 1000 : (242.0...250.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm: 15.8

1st rack travel in: 12.70

rpm : 1035...1050 Speed 2nd rack travel in: 4.00 rpm : 1130...1160 Speed 4th rack travel in: 1250 rpm : 0.00...1.40Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 250 Speed Rack travel in mm: 6.7 Testing: Speed : 100 rpm Minimum rack trave: 8.20 : 250 rpm Rack travel in mm : 6.60...6.80 Rack travel in mm : 2.00 Speed rpm : 345...385 TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 850 Rack travel in m: 14.00...14.10 2nd speed rpm : 1000 Rack travel in m: 13.90...14.10 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 1000 Pressure : 13.70...13.80 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : -Rack travel in m: 11.00...11.20 2nd pressure hPa : 460 Rack travel in m: 13.00...13.10 3rd pressure hPa : 310 Rack travel in m: 12.00...12.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Del.quantity cm3/: 171.0...173.0 1000 s: (168.0...176.0)

1mm rack travel less than

full load rack tr: 12.70 Speed rpm : 1035...1050

Speed

LOW IDLE

Speed rpm : 250

Rack travel in mm : 6.60...6.80

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

K23

BREAKAWAY

1st version

Note remarks

: MB 11.0 t 4 : 05.10.90 Test sheet Edition : 5.1.90 Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 897

Injection pump

Pump designation : PE6P120A320LS7808 : 0 412 626 816

EP type number

Governor

Governor design. : RQ300/950PA762-10

: 0 421 801 511 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M441 LA Engine

: 249.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35) Rack travel in mm : 20.00...21.00

: 6-3-5-2-4-1 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 13.90...14.10

Del.guantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm : 5.7...6.0 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 900

: 214.0...216.0 Del.quantity 1000 : (211.0...219.0)

: 5.00 Spread cm3 : (9.00) 1000

RATED SPEED

1st version

Setting point:

: 600 rpm Rack travel in mm : 20.0

Testing: 1st rack travel in: 13.80 rpm : 990...1005 Speed 2nd rack travel in: 4.00 rpm : 1065...1095 Speed 4th rack travel in: 1200 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring : 300 rpm Rack travel in mm: 5.8 Testing: Speed rpm Minimum rack trave: 7.70 Speed rpm : 300 Rack travel in mm : 5.70...6.00 Rack travel in mm : 2.00 : 380...420 Speed rpm Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 900 Pressure : 13.90...14.10 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 11.00...11.20 2nd pressure hPa : 550 Rack travel in m: 13.10...13.30 3rd pressure hPa : 1100 Rack travel in m: 14.10...14.20 4th pressure hPa : 1200 Rack travel in m: 14.50...14.70 5th pressure hPa : -Rack travel in m: 9.50...9.80 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1350 rpm\_ : 950 Speed Del.quantity cm3/: 241.0...243.0 1000 s: (238.0...246.0) Spread cm3: 8.00

1000 s: (12.0)

Aneroid pressure h: 1350
Speed rpm : 800
Del.quantity cm3/: 237.0...241.0
1000 s: (234.0...244.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: Speed rpm : 500
Del.quantity cm3/: 145.0...147.0
1000 s: (142.0...150.0)
Spread cm3 : 8.00

1000 s: (12.0)

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 13.80 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 205.0...225.0 1000 s: (201.0...229.0)

:

Remarks:

Note remarks

: MB 11,0 t 5 Test sheet : 05.10.90 Edition : 23.3.90 Replaces Test oil : ISO-4113

Combination no. : 0 402 646 901

Injection pump

Pump designation : PE6P120A320LS7808 EP type number : 0 412 626 816

Governor

Governor design. : RQV300...950PA797-12

: 0 421 813 840 Governer no.

Customer-spec, information

: MERCEDES-BENZ Customer

Engine : 0M441 LA

: 249.0 1st version kW Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35) Rack travel in mm : 20.00...21.00

: 6-3-5-2-4-1 Firing order

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 13.90...14.10

Del.guantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm : 5.7...6.0 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.10...1.40 travel mm

rpm : 620 2nd speed

travel mm : 5.00...5.40 rpm : 780 3rd speed

travel mm

: 6.00...6.50

rpm : 1010 4th speed

travel mm : 8.30...8.80

rpm : 11005th speed

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1040 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 600 Speed Aneroid pressure h: 900 : 214.0...216.0 Del.quantity 1000 : (211.0...219.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 117...125 Testina: 1st rack travel in: 13.80 rpm : 990...1000 Speed 2nd rack travel in: 4.00 : 1065...1095 Speed rom 4th rack travel in: 1200 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 80...88 Testing: : 200 Speed rpm Minimum rack trave: 7.70 : 300 rpm Rack travel in mm : 5.70...6.00 CONSTANT REGULATION rpm : 300...500 Speed Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 900 Pressure : 13.90...14.10 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 11.00...11.20 2nd pressure hPa : 550 Rack travel in m: 13.10...13.30 3rd pressure hPa : 1100 Rack travel in m: 14.10...14.20 4th pressure hPa : 1200 Rack travel in m: 14.50...14.70 5th pressure hPa : Rack travel in m: 9.50...9.80

1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1350 rpm\_ : 950 Speed Del.quantity cm3/: 241.0...243.0 1000 s: (238.0...246.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 1350 Speed : 800 rom Del.quantity cm3/: 237.0...241.0 1000 s: (234.0...244.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 145.0...147.0 1000 s: (142.0...150.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.80 rpm : 990...1000 Speed STARTING FUEL DELIVERY Speed : 100 rpm

Del.quantity cm3/: 205.0...225.0 1000 s: (201.0...229.0)

Remarks:

START CUT-OUT

Note remarks

Test sheet : FIA 13,8 w : 21.09.90 Edition : 6.7.90 Replaces

: ISO-4113 Test oil

Combination no. : 0 402 646 902

Injection pump

Pump designation : PE6P130A720RS7197

: 0 412 636 815 EP type number

Governor

Governor design. : RQV300...900PA946 Governer no. : 0 421 813 845

Customer-spec. information

Customer : IVECO-FIAT

: 8210,42,151 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 25.5...25.8

100 s: (25.1...26.1)

cm3 : 0.6Spread

100 s: (1.0)

2nd speed rpm : 300.0 Rack travel in mm : 5.1...5.5

Del.quantity cm3/: 1.9...2.5 100 s: (1.5...2.9)

Spread cm3 : 1.0

100 s: (1.4)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.00...1.40 travel mm

: 450 2nd speed rpm : 2.80...3.40 travel mm

: 700 3rd speed rpm

: 5.50...5.90 travel mm

: 900 4th speed

rpm : 7.70...7.90 travel mm

: 1200 5th speed rpm

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 935 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

Aneroid pressure h: 900

Del.quantity : 253.0...261.5)

Spread cm3 : 6.001000 : (10.00) RATED SPEED 1st version Control lever position degrees: 118...126 Testina: 1st rack travel in: 12.50 rpm : 940...950 Speed 2nd rack travel in: 4.00 Speed rpm : 1020...1050 4th rack travel in: 1200 rpm : 0.00...1.00 Speeಚ LOW IDLE 1 Control lever position degrees: 76...84 Testing: rpm : 100Speed Minimum rack trave: 6.80 rpm : 300

Rack travel in mm : 5.20...5.40

CONSTANT REGULATION rpm : 320...440 Speed

Aneroid/Altitude Compensator Test

1st version

Measurement

Settina : 500 Speed rpm hPa : 900 Pressure Rack travel mm

: 13.40...13.50

 $1/\min : 500$ Speed 1st pressure hPa : -

Rack travel in m: 10.70...10.90 2nd pressure hPa : 345 Rack travel in m: 12.70...12.80

3rd pressure hPa : 275

Rack travel in m: 11.10...11.60

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 900 rpm : 500 Speed Del.quantity cm3/: 269.0...276.0 1000 s: (269.0...276.0) Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 181.0...184.0 1000 s: (177.5...187.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.50 rpm : 940...950 Speed

INTERMEDIATE RATED SPEED Rack travel in mm: 4.00

STARTING FUEL DELIVERY

rpm : 100 Speed Del.quantity cm3/: 240.0...270.0 1000 s: (236.0...274.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 5.10...5.50 Del.quantity cm3/ : 19.0...25.0 1000 s: (15.0...29.0)

cm3 : 10.00 Spread 1000 s: (14.00)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

: MB 11,0 t 7 : 05.10.90 Test sheet Edition : 6.4.90 Replaces : ISO-4113 Test oil

Combination no. : 0 402 646 908

Injection pump

Pump designation : PE6P120A320LS7808 : 0 412 626 816 EP type number

Governor

Governor design. : RQ300/950PA932-3 Governer no. : 0 421 801 528

Customer-spec, information

: MERCEDES-BENZ Customer

: 0M441 LA Engine

: 249.0 1st version kW Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35) Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 13.90...14.10

Del.guantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm : 5.7...6.0 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

Spread cm3 : 0.6100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Ane id pressure h: 900

: 214.0...216.0 Del quantity 1000 : (211.0...219.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm : 600 Speed Rack travel in mm : 20.0

Testina: 1st rack travel in: 13.80 rpm : 990...1005 Speed 2nd rack travel in: 4.00 rpm : 1065...1095 Speed 4th rack travel in: 1200 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 5.8 Testing: Speed rpm Minimum rack trave: 7.70 Speed : 300 rpm Rack travel in mm : 5.70...6.00 Rack travel in mm: 2.00 : 380...420 Speed rpm Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed man hPa : 900 Pressure : 13.90...14.10 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : 300 Rack travel in m: 11.00...11.20 2nd pressure hPa : 550 Rack travel in m: 13.10...13.30 3rd pressure hPa : 1100 Rack travel in m: 14.10...14.20 4th pressure hPa : 1200 Rack travel in m: 14.50...14.70 5th pressure hPa : -Rack travel in m: 9.50...9.80 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1350 Speed rpm : 950 Del.quantity cm3/ : 241.0...243.0 1000 s: (238.0...246.0) Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1350 : 800 Speed rom Del.quantity cm3/: 237.0...241.0 1000 s: (234.0...244.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 145.0...147.0 1000 s: (142.0...150.0) Spread cm3 : 8.001000 s: (12.0)

#### BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.80 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 205.0...225.0 1000 s: (201.0...229.0)

Remarks:

Note remarks

Test sheet : DAF 11,7 l
Edition : 20.07.90
Replaces : 6.7.90
Test oil : ISO-4113

Combination no. : 0 402 646 912

Injection pump

Pump designation : PE6P12OA32ORS7218 EP type number : 0 412 626 839

Governor

Governor design. : RQ250/1000PA936-1 Governor no. : 0 421 801 508

Customer—spec. information Customer : DAF

Engine : WS 268

1st version kW : 268.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40

: (5.25...5.45)

Rack travel in mm : 14.50...15.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-303

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 15.00...15.10

Del.quantity cm3/: 23.7...23.9

100 s: (23.4...24.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 6.4...6.8 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.80...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 850 Aneroid pressure h: 1000

Del.quantity : 237.0...239.0 1000 : (234.0...242.0)

cm3 : 5.00

1000 : (9.00)

RATED SPEED

Spread

1st version

Setting point:

Speed rpm : 550 Rack travel in mm: 16.4

Testina:

1st rack travel in: 14.00

rpm : 1035...1050 Speed

2nd rack travel in: 4.00

Speed rpm : 1140...1170 4th rack travel in: 1250

rpm : 0.00...2.00Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm : 5.0

Testing:

Speed rpm : 100 Minimum rack trave: 7.00 rpm : 250

Rack travel in mm : 4.90...5.10

Rack travel in mm: 2.00

rpm : 310...350 Speed

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 15.30...15.40

2nd speed rpm : 1000

Rack travel in m: 15.20...15.40

Aneroid/Altitude Compensator Test

1st version

Setting

rpm : 600 Speed hPa : 1000 Pressure

Rack travel mm : 15.00...15.10

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 12.40...12.60

2nd pressure hPa : 480 Rack travel in m: 14.20...14.30 3rd pressure hPa : 330 Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/: 166.0...170.0 1000 s: (164.0...172.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 14.00

rpm : 1035...1050 Speed

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet : UNI 13,8 g : 17.09.90 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 914

Injection pump

Pump designation : PE6P130A720RS7197

EP type number : 0 412 636 815

Governor

Governor design. : RQ300/900PA968 Governer no. : 0 421 801 540

Customer-spec. information

: IVECO-UNIC Customer

: 8210.42.153 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 25.5...25.8

100 s: (25.1...26.1)

cm3 : 0.6Spread

100 s: (1.0)

rpm : 300.0 2nd speed

Rack travel in mm : 5.1...5.5 Del.quantity cm3/ : 1.9...2.5 100 s: (1.5...2.9)

cm3 : 1.0Spread

100 s: (1.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2 rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

Aneroid pressure h: 900

Anerous Deliquantity 1000

: 255.0...258.0 : (251.5...261.5)

: 6.00 Spread cm3

1000 : (10.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm : 20.0

Testina:

1st rack travel in: 12.50 Speed rpm : 945...960

2nd rack travel in: 4.00

rpm : 1070...1100 Speed

4th rack travel in: 1250

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 5.3

Testing:

: 100 Speed rpm Minimum rack trave: 6.80

: 300 rpm

Rack travel in mm : 5.20...5.40 Rack travel in mm : 2.00

: 380...420 Speed rpm

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 900 1st speed

Rack travel in m: 13.50...13.60

2nd speed rpm : 600

Rack travel in m: 13.50...13.70

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rom hPa : 900 Pressure

: 13.50...13.60 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.70...10.90

2nd pressure hPa : 345

Rack travel in m: 12.70...12.80

3rd pressure hPa : 275
Rack travel in m: 11.10...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm : 500 Speed

Del.quantity cm3/: 269.0...276.0 1000 s: (269.0...276.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 181.0...184.0

1000 s: (177.5...187.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.50

rpm : 945...960 Speed

INTERMEDIATE RATED SPEED

Rack travel in mm: 4.00

STARTING FUEL DELIVERY

Speed

rpm : 100

LOW IDLE

Speed rpm : 300 Rack travel in mm : 5.10...5.50 Del.quantity cm3/ : 19.0...25.0

1000 s: (15.0...29.0) cm3 : 10.00

1000 s: (14.00)

Remarks:

Spread

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

APPLICATION

**Omnibus** 

Note remarks

Test sheet : MB 14,7 a 1 Edition : 31.08.90 : 15.3.90 Replaces Test oil : ISO-4113

Combination no. : 0 402 648 812

Injection pump

Pump designation : PE8P120A320LS7801 EP type number : 0 412 628 806

Governor

Governor design. : RQ300/1050PA717 : 0 421 801 258 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

Engine : 0M442 LA

1st version kW : 320.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening.

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35) Rack travel in mm : 20.00...21.00

: 8- 7- 2- 6- 3- 5-Firing order

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.70...14.90

Del.quantity cm3/: 22.1...22.3

100 s: (21.8...22.6)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 300.0 Rack travel in mm : 6.1...6.7 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.5 Spread

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm : 600 Aneroid pressure h: 680

: 221.0...223.0 Del.quantity 1000 : (218.0...226.0)

Spread cm3 : 4.00

1000 : (7.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm: 20.0 Testing: 1st rack travel in: 14.40 rpm : 1095...1110 Speed 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 4th rack travel in: 1300 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.4 Testing: : 200 Speed rpm Minimum rack trave: 8.00 : 300 Speed rpm Rack travel in mm : 6.10...6.70 Rack travel in mm: 2.00 : 380...420 Speed rpm TORQUE CONTROL Dimension a mm : 0.90 rpm : 1050 2nd speed Rack travel in m: 15.20...15.40 3rd speed rpm : 850 Rack travel in m: 15.80...16.10 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 600 hPa : 680 Pressure : 14.70...14.90 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 310 Rack travel in m: 12.10...12.30 2nd pressure hPa : 470 Rack travel in m: 13.70...13.90 3rd pressure hPa : 820 Rack travel in m: 14.90...15.00 4th pressure hPa : 950 Rack travel in m: 15.60...15.90 5th pressure hPa : -Rack travel in m: 11.40...11.50 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1150 : 1050 Speed rpm Del.quantity cm3/: 229.0...232.0 1000 s: (226.0...235.0) cm3 : 7.00Spread 1000 s: (10.0) Aneroid pressure h: 1150 Speed rpm Del.quantity cm3/: 246.0...250.0 1000 s: (243.0...253.0) cm3 : 7.00 Spread 1000 s: (10.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 148.0...150.0 1000 s: (145.0...153.0) cm3 : 7.00Spread 1000 s: (10.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 14.40 Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0)

Remarks:

Note remarks

: MB 14,7 b : 31.08.90 : 25.3.88 Test sheet Edition Replaces Test oil : ISO-4113

Combination no. : 0 402 648 824

Injection pump

Pump designation : PE8P120A320LS7801 : 0 412 628 806 EP type number

Governor

Governor design. : RQV300...1050PA797

: 0 421 813 532 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

: 0M442 LA Engine

: 320.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.70...14.90

Del.quantity cm3/: 22.1...22.3

100 s: (21.8...22.6)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 300.02nd speed

Rack travel in mm: 6.2...6.6 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.5

Spread

100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 300 : 1.20...1.40 travel mm

rpm : 600 2nd speed

: 4.90...5.10 travel mm

rpm : 1075 3rd speed

: 7.40...7.60 travel mm

rpm : 1100 4th speed

: 8.00...8.20 travel mm

5th speed rpm: 1150

: 9.00...9.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1125

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

Rack travel in m: 14.90...15.00 1st version 4th pressure hPa : 1100 rpm : 600 Speed Rack travel in m: 15.90...16.00 Aneroid pressure h: 680 Del.quantity : 221.0...223.0 1000 : (218.0...226.0) : 4.00 cm3Spread 1000 : (7.00) START CUT-OUT RATED SPEED Speed 1st version Control lever position degrees: 117...125 1st version Testina: Speed 1st rack travel in: 14.20 rpm rpm : 1095...1:10 Speed 2nd rack travel in: 4.00 rpm : 1160...1190 Spread Speed 4th rack travel in: 1300 rpm : 0.00...1.50Speed Speed rpm LOW IDLE 1 Control lever position degrees: 82...90 Spread Testina: Speed rom Speed rpm Minimum rack trave: 7.90 rpm : 300 Rack travel in mm : 6.20...6.40 Spread CONSTANT REGULATION : 300...500 Speed rpm **BREAKAWAY** TORQUE CONTROL : 0.40 Dimension a mm 1st version : 1050 2nd speed rpm Rack travel in m: 15.20...15.40 3rd speed rpm : 850 Rack travel in m: 15.80...16.10 Speed Aneroid/Altitude Compensator Test Speed rpm 1st version Setting : 600 Speed rpm Pressure hPa : 680 Remarks: Rack travel mm : 14.70...14.90 Measurement  $1/\min : 600$ Speed 1st pressure hPa : 310 Rack travel in m: 12.10...12.30 2nd pressure hPa : 470 Rack travel in m: 13.70..13.90

5th pressure hPa : -Rack travel in m: 11.40...11.50 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS Aneroid pressure h: 1150 : 1050 Del.quantity cm3/: 229.0...232.0 1000 s: (226.0...235.0) cm3 : 7.001000 s: (10.0) Aneroid pressure h: 1150 : 850 Del.quantity cm3/: 246.0...250.0 1000 s: (243.0...253.0) cm3 : 7.00 1000 s: (10.0) Aneroid pressure h: -: 500 Del.quantity cm3/: 148.0...150.0 1000 s: (145.0...153.0) cm3 : 7.001000 s: (10.0) 1mm rack travel less than full load rack tr: 14.20 rpm : 1095...1110 STARTING FUEL DELIVERY : 100 Del.quantity cm3/: 200.0...220.0 1000 s: (196.0...224.0)

3rd pressure hPa : 820

Note remarks

: MB 14,7 e 2 Test sheet : 31.07.90 Edition : 8.6.90 Replaces : ISO-4113 Test oil

Combination no. : 0 402 648 831

Injection pump

Pump designation : PE8P120A320LS7801-1

EP type number : 0 412 628 818

Governor

Governor design. : RQV350...1050PA842-7

: 0 421 813 874 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M442 LA Engine

1st version kW : 320.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35) Rack travel in mm : 20.00...21.00

: 8-7-2-6-3-5firing order

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.50...14.70

Del.quantity cm3/: 21.2...21.4

100 s: (20.9...21.7)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.02nd speed

Rack travel in mm: 5.7...5.9 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 350 : 0.80...1.20 travel mm

2nd speed

rpm : 510 : 3.60...4.10 rpm : 1100 travel mm

3rd speed

: 7.80...8.40 travel mm

rpm : 1270 4th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1125 Speed

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

4th pressure hPa : 1250 rpm : 600 Speed Rack travel in m: 15.50...15.70 Aneroid pressure h: 750 : 212.0...214.0 1000 : (209.0...217.0) 5th pressure hPa : -Del.quantity Rack travel in m: 11.20...11.40 cm3 : 5.00 1000 : (9.00) Spread START CUT-OUT Speed 1/min: 270 (290) RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 64...72 1st version Aneroid pressure h: 1250 Speed rpm : 1050 Del.quantity cm3/: 227.0...230.0 1000 s: (224.0...233.0) Testing: 1st rack travel in: 14.20 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1160...1190 cm3 : 8.00Spread Speed 1000 s: (12.0) 4th rack travel in: 1300 rpm : 0.00...1.50Aneroid pressure h: 1250 Speed : 900 Speed rpm Del.quantity cm3/: 238.0...242.0 1000 s: (235.0...245.0) Spread cm3 : 8.00 LOW IDLE 1 Control lever position degrees: 8...16 1000 s: (12.0) Aneroid pressure h: 1250 Testina: Speed rpm : 1050
Del.quantity cm3/ : 156.0...159.0 \* rpm : 100 Speed Minimum rack trave: 7.40 rpm : 350 1000 s: (153.0...162.0) cm3 : 8.00 Rack travel in mm : 5.50...6.10 Spread 1000 s: (12.00 CONSTANT REGULATION Aneroid pressure h: rpm : 500 rpm : 350...550 Speed Speed Del.quantity cm3/: 150.0...152.0 1000 s: (147.0...155.0) TORQUE CONTROL cm3 : 8.00 Dimension a mm : 0.40 Spread 2nd speed rpm : 1050 1000 s: (12.0) Rack travel in m: 15.20...15.40 3rd speed rpm : 975 Rack travel in m: 15.60...15.80 BREAKAWAY 1st version Aneroid/Altitude 1mm rack travel less than Compensator Test full load rack tr: 14.20 rpm : 1090...1100 1st version Speed Settina : 600 STARTING FUEL DELIVERY Speed rpm hPa : 750 Pressure Rack travel mm : 14.50...14.70 beed rpm : 100 Del.quantity cm3/: 240.0...260.0 Measurement 1000 s: (236.0...264.0) Speed 1/min: 600 1st pressure hPa : 400 Remarks: Rack travel in m: 12.20...12.40 2nd pressure hPa : 550 Rack travel in m: 13.60...13.80 \* = Set at reduced-delivery stop. 3rd pressure hPa : 900

Rack travel in m: 14.70...14.80

Note remarks

: MB 14,7 a 8 : 20.07.90 Test sheet Edition : 1.2.90 Replaces : ISO-4113 Test oil

Combination no. : 0 402 648 841

Injection pump

Pump designation : PE8P120A320LS7801-1

: 0 412 628 818 EP type number

Governor

Governor design. : RQ300/1050PA762-5

: 0 421 801 399 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M442 A Engine

: 260.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 20.4...20.6

100 s: (20.1...20.9)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2nd speed

Rack travel in mm: 6.0...6.6 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.5Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 500 Speed Aneroid pressure h: 650

: 204.0...206.0 Del.quantity 1000 : (201.0...209.0)

: 4.00 cm3

Spread 1000 : (7.00)

RATED SPEED

1st version

Setting point:

: 600 Speed man

Rack travel in mm: 20.0 Testina: 1st rack travel in: 11.70 rpm : 1095...1110 Speed 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 6.3 Testing: Speed : 200 rpm Minimum rack trave: 8.00 : 300 Speed rpm Rack travel in mm : 6.20...6.40 Rack travel in mm : 2.00 Speed rpm : 380...420 TORQUE CONTROL Dimension a mm : 0.75 : 1050 2nd speed rom Rack travel in m: 12.70...12.90 3rd speed rpm : 850 Rack travel in m: 13.70...14.00 4th speed rpm : 700 Rack travel in m: 14.40...14.60 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm Pressure hPa : 650 : 14.00...14.20 Rack travel mm Measurement  $1/\min: 600$ Speed 1st pressure hPa : 300 Rack travel in m: 12.30...12.50 2nd pressure hPa : 400 Rack travel in m: 13.30...13.60 3rd pressure hPa : 850 Rack travel in m: 14.60...14.70 \* 4th pressure hPa : -Rack travel in m: 11.40...11.70 START CUT-OUT 1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1050 1050 Speed rpm Del.quantity cm3/: 178.0...181.0 1000 s: (175.0...184.0) cm3 : 7.00Spread 1000 s: (10.0) Aneroid pressure h: 1050 : 700 Speed rpm Del.quantity cm3/ : 213.0...217.0 1000 s: (210.0...220.0) : 7.00 Spread cm3 1000 s: (10.0) Aneroid pressure h: 1050 : 850 Speed rpm Del.quantity cm3/: 202.0...206.0 1000 s: (199.0...209.0) cm3 : 7.00Spread 1000 s: (10.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 146.0...148.0 1000 s: (143.0...151.0) cm3 : 7.00Spread 1000 s: (10.0)

## **BREAKAWAY**

1st version
1mm rack travel less than

full load rack tr: 11.70 Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 175.0...190.0 1000 s: (171.0...194.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

Test sheet : MB 14,7 q : 31.07.90 Edition : 5.1.90 Replaces : ISO-4113 Test oil

: 0 402 648 864 Combination no.

Injection pump

Pump designation : PE8P120A320LS7816 : 0 412 628 829 EP type number

Governor

Governor design. : RQ300/950PA762-7 : 0 421 801 480 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M442 LA Engine

: 353.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm : 600 1st speed

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 25.4...25.6

100 s: (25.1...25.9)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 5.9...6.5 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 1000

: 254.0...256.0 Del.quantity 1000 : (251.0...259.0)

: 6.00

Spread cm3 1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm : 600 Speed

Rack travel in mm : 20.0 Testina: 1st rack travel in: 14.20 Speed rpm : 990...1005 Speed 2nd rack travel in: 4.00 Speed rpm : 1070...1100 4th rack travel in: 1150 Speed Spread rom : 0.00...1.50Speed Speed LOW IDLE 1 Setting point w/out bumper spring Spread rpm Rack travel in mm: 6.2 Testina: Speed Speed rpm : 200 Minimum rack trave: 7.80 : 300 rpm Spread Speed Rack travel in mm : 5.90...6.50 Rack travel in mm : 2.00 : 380...420 Speed rom **BREAKAWAY** TORQUE CONTROL Dimension a mm : 0.90 1st version : 950 2nd speed rpm Rack travel in m: 15.20...15.40 rpm : 800 3rd speed Rack travel in m: 15.50...15.70 Speed Aneroid/Altitude Compensator Test Speed 1st version Settina : 600 Speed rpm hPa : 1000 Remarks: Pressure Rack travel mm : 14.60...14.80 Measurement  $1/\min: 600$ Speed 1st pressure hPa : 350 Rack travel in m: 12.20...12.40 2nd pressure hPa : 700 Rack travel in m: 14.10...14.30 3rd pressure hPa : 1200 Rack travel in m: 14.80...15.00 4th pressure hPa : 1500 Rack travel in m: 15.40...15.60 5th pressure hPa : -Rack travel in m: 10.20...10.50 START CUT-OUT 1/min : 220 (240) Speed

1st version Aneroid pressure h: 1600 : 950 rpm Del.quantity cm3/: 270.0...273.0 1000 s: (267.0...276.0) cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1600 : 800 rpm Del.quantity cm3/: 270.0...274.0 1000 s: (267.0...277.0) : 8.00 cm31000 s: (12.0) Aneroid pressure h: -: 500 rom Del.quantity cm3/: 145.0...147.0 1000 s: (142.0...150.0) cm3 : 8.001000 s: (12.0)

1mm rack travel less than

full load rack tr: 14.20 rpm : 990...1005

STARTING FUEL DELIVERY

: 100 rpm Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0)

FUEL DELIVERY CHARACTERISTICS

Note remarks

: MB 14,7 k 1 : 31.07.90 Test sheet Edition : 6.7.90 Replaces Test oil : ISO-4113

Combination no. : 0 402 648 881

Injection pump

Pump designation : PE8P120A320LS7816 EP type number : 0 412 628 829

Governor

Governor design. : RQV300...950PA797-13 Governer no. : 0 421 813 841

Customer-spec. information

Customer : MERCEDES-BENZ

: 0M442 LA Engine

: 353.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 : (5.15...5.35) Prestroke mm

Rack travel in mm : 20.00...21.00

: 8-7-2-6-3-5-Firing order

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

: 8 Time to cyl. no.

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 25.4...25.6

100 s: (25.1...25.9)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread 100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.10...1.40 travel mm

rpm : 700 2nd speed

: 5.50...6.00 travel mm

rpm : 1100 3rd speed

: 8.30...8.80 travel mm

: 1090 4th speed rpm

: 9.70...10.20 travel mm

: 1190 5th speed rom

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1000

Speed Rack travel in mm : 16.20...18.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 600 Aneroid pressure h: 1000 : 254.0...256.0 Del.quantity 1000 : (251.0...259.0) : 6.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 120...128 Testina: 1st rack travel in: 14.20 rpm : 990...1000 Speed 2nd rack travel in: 4.00 rpm : 1070...1100 Speed 4th rack travel in: 1150 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 82...90 Testing: Speed rpm Minimum rack trave: 7.80 : 300 rpm Rack travel in mm : 5.90...6.50 CONSTANT REGULATION rpm : 300...500 Speed TORQUE CONTROL Dimension a mm : 0.30 : 950 2nd speed rpm Rack travel in m: 15.20...15.40 3rd speed rpm : 800 Rack travel in m: 15.50...15.70 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed וווכות hPa : 1000 Pressure : 14.60...14.80 Rack travel mm Measurement Speed 1/min : 600 1st pressure hPa : 350 Rack travel in m: 12.00...12.20 2nd pressure hPa : 700

Rack travel in m: 13.80...14.00

3rd pressure hPa : 1200 Rack travel in m: 14.80...15.00 4th pressure hPa : -Rack travel in m: 10.20...10.50 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1600 : 950 Speed rpm Del.quantity cm3/: 270.0...273.0 1000 s: (267.0...276.0) cm3 : 8.00Spread 1000 s: (12.) Aneroid pressure h: 1600 : 800 Speed rpm Del.quantity cm3/: 270.0...274.0 1000 s: (267.0...277.0) Spread cm3 : 8.00 1000 s: (12.00 Speed rpm : 500 Del.quantity cm3/ : 145.0...147.0 1000 s: (142.0...150.0) Spread cm3 : 8.001000 s: (12.00 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 14.20 rom : 990...1000 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0) Remarks:

Note remarks

Test sheet : MTU 14,6 a1 Edition : 31.07.90

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 884

Injection pump

Pump designation : PE8P12OA32OLS7830

EP type number : 0 412 628 844

Governor

: RQV350...1150PA870-Governor design.

10

: 0 421 813 879 Governer no.

Customer-spec. information Customer : MTU

: 8V 183 TE92 Engine

: 490.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENT'

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 4.40...4.50 : (4.35...4.55)

Rack travel in mm : 19.50...21.00

: 8-7-2-6-3-5-Firing order

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 14.80...14.90

Del.guantity cm3/: 31.1...31.3

100 s: (30.8...31.6)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 350.02nd speed Rack travel in mm : 5.0...5.6 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.90...2.40 travel mm

rpm : 500 2nd speed

: 3.00...3.50 travel mm

3rd speed rpm : 800

: 4.30...4.80 travel mm

1200 4th speed rpm

: 8.30...8.90 : 1250 travel mm

5th speed rpm

: 9.30...10.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1275 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1150 Speed Aneroid pressure h: 2000 Del.quantity : 311.0...313.0 1000 : (308.0...316.0) cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Control lever position degrees: 113...121 Testina: 1st rack travel in: 13.80 rpm : 1190...1200 Speed 2nd rack travel in: 4.00 rpm : 1270...1300 Speed 4th rack travel in: 1350 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 62...70 Testing: : 250 Speed rom Minimum rack trave: 7.00 : 350 Speed rpm Rack travel in mm : 5.00...5.60 CONSTANT REGULATION rpm : 350...600 Speed Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : -: 7.10...7.30 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 400 Rack travel in m: 8.30...8.40 2nd pressure hPa : 1200 Rack travel in m: 12.50...12.80 START CUT-OUT 1/min: 310 (330) Speed

1st version Aneroid pressure h: 2000 : 750 Speed rpm Del.quantity cm3/: 303.0...313.0 1000 s: (300.0...316.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 2000 : 1150 Speed rpm Del.quantity cm3/: 240.0...243.0 \* 1000 s: (237.0...246.0) : 8.00 Spread cm3 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 120.0...122.0 1000 s: (117.0...125.0) cm3 : 8.00 Spread 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.80 Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 320.0...340.0 1000 s: (316.0...344.0)

Remarks:

\* = Set at reduced-delivery stop.

FUEL DELIVERY CHARACTERISTICS

Note remarks

: MB 14,7 a23 Test sheet : 14.09.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 648 892

Injection pump

Pump designation : PE8P12OA32OLS7801-1

: 0 412 628 818 EP type number

Governor

Governor design. : RQV350...950PA866-7

Governer no. : 0 421 813 882

Customer-spec, information

Customer : MERCEDES-BENZ

: 0M442 A Engine

1st version kW : 266.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 20.00...21.00 : 8-7-2-6-3-5-Firina order

4- 1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 20.0...20.2

100 s: (19.7...20.5)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.02nd speed

Rack travel in mm: 5.7...5.9 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread 100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.30...1.80 travel mm

2nd speed rpm : 424

: 2.30...2.80 travel mm

3rd speed rpm : 700

travel mm : 4.10...4.60

rpm : 1008 4th speed

: 7.90...8.40 travel mm

rpm : 1220 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1025Speed

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

2nd pressure hPa : 375 Rack travel in m: 13.40...13.60 1st version 3rd pressure hPa : 900 Speed rpm : 600 Aneroid pressure h: 650 Rack travel in m: 14.10...14.20 \* : 200.0...202.0 Del.quantity 1000 : (197.0...205.0) START CUT-OUT : 5.00 Spread cm31000 : (9.00)1/min : 270 (290) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever 1st version position degrees: 115...123 Aneroid pressure h: 1100 rpm : 950 Speed Del.quantity cm3/: 190.0...193.0 Testina: 1000 s: (187.0...196.0) 1st rack travel in: 12.20 cm3 : 8.00rpm : 990...1000 Speed Spread 1000 s: (12.0) 2nd rack travel in: 4.00 Speed rpm : 1075...1105 4th rack travel in: 1150 Aneroid pressure h: 1100 Speed rpm Del.quantity cm3/: 213.0...217.0 Speed rpm : 0.00...1.501000 s: (210.0...220.0) cm3 : 8.00 LOW IDLE 1 Spread 1000 s: (12.0) Control lever position degrees: 81...89 Aneroid pressure h: 1100 Speed rpm : 950 Del.quantity cm3/: 163.0...165.0 \* 1000 s: (160.0...168.0) Testina: : 100 Speed rpm cm3 : 8.00 Minimum rack trave: 7.40 Spread 1000 s: (12.0) : 350 rpm Rack travel in mm : 5.50...6.10 Aneroid pressure h: rpm Del.quantity cm3/: 147.0...149.0 CONSTANT REGULATION 1000 s: (144.0...152.0) rpm : 350...550 Speed cm3 : 8.00Spread 1000 s: (12.0) TORQUE CONTROL Dimension a mm : 1.10 2nd speed : 950 rpm Rack travel in m: 13.20...13.40 BREAKAWAY 3rd speed : 900 rom Rack travel in m: 13.50...13.60 1st version 4th speed rpm : 800 1mm rack travel less than Rack travel in m: 14.30...14.50 full load rack tr: 12.20 rpm : 990...1000 Aneroid/Altitude Speed Compensator Test STARTING FUEL DELIVERY 1st version Setting beea : 100 rpm Del.quantity cm3/: 200.0...220.0 1000 s: (196.0...224.0) Speed : 600 rpm Pressure hPa : 650 : 14.00...14.20 Rack travel mm Remarks: Measurement  $1/\min : 600$ Speed \* Increase in control-rod travel with 1st pressure hPa : 300 respect to setting at least 0.1 mm Rack travel in m: 12.30...12.50

\* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 18,2 j Edition : 20.07.90 : 19.6.90 Replaces Test oil : ISO-4113 Combination no. : 0 402 649 811 Injection pump Pump designation : PE10P120A520LS7831 EP type number : 0 412 629 806 Governor Governor design. : RQ300/950PA950 : 0 421 801 520 Governer no. Customer-spec. information Customer : MAN : D 2840 LF Engine 1st version kW : 368.0 : 1900 Rated speed TEST BENCH REQUIREMENTS Test oil : 38...42 inlet temp. °C Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly **Opening** : 207...210 pressure, bar Orifice plate : 0,8 diameter mm Test lines : 1 680 750 067 Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm (A) Injection pump setting values Irea. values in parentheses

See equal delivery cont.

per values \_\_\_\_

Test pressure, bar: 25...27

BEGINNING OF DELIVERY

: 5.00...5.10 Prestroke mm : (4.95...5.15) Rack travel in mm : 13.00...14.00 Firing order : 10- 9- 4- 1-- 6- 3- 5-Phasing : 0-45-72-117-144-189-216-261-288-333 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 10 BASIC SETTING rpm: 950 1st speed Rack travel in mm : 13.50...13.60 Del.quantity cm3/: 22.9...23.1 100 s: (22.6...23.4) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 300.0 Rack travel in mm : 5.0...5.4 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) cm3 : 0.8Spread 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 950 Aneroid pressure h: 1000 : 229.0...231.0 Del.quantity 1000 : (226.0...234.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Setting point: rpm : 600 Speed Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50 Speed rpm : 995...1010 2nd rack travel in: 4.00 rpm : 1040...1070 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm : 5.2 Testing: rpm : 100 Speed Minimum rack trave: 6.70 rpm : 300 Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00 : 370...410 rom TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 950 1st speed Rack travel in m: 13.70...13.80 2nd speed rpm : 600 Rack travel in m: 13.70...13.90 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : 1000 : 13.50...13.60 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.70...10.90 2nd pressure hPa : 200 Rack travel in m: 11.10...11.20 3rd pressure hPa : 500 Rack travel in m: 12.80...13.10 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000

rpm : 600 Del.quantity cm3/: 225.0...231.0

rpm : 600

1000 s: (222.0...234.0)

Del.quantity cm3/: 122.0...130.0 1000 s: (119.0...133.0) cm3 : 12.00Spread 1000 s: (16.0) Aneroid pressure h: rpm : 500 Del.quantity cm3/: 151.0...153.0 1000 s: (148.0...156.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.50 rpm : 995...1010 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 170.0...190.0 1000 s: (166.0...194.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 5.00...5.40 ▶ Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) cm3 : 8.00 1000 s: (12.00) Spread Remarks: : MAN-NR. 3-7014 Setting and blocking of pointer of start-of-delivery sensor on cyl. 10 start of delivery

Speed

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Note remarks : MAN 10,0 c Test sheet : 31.07.90 Edition : 6.7.90 Replaces Test oil : ISO-4113 Phasing Combination no. : 0 402 735 800 Injection pump Pump designation: PES5P120A720/3LS7210 : 0 412 725 808 EP type number Governor Governor design. : RQV325...1000PA962K : 0 421 815 246 Governer no. Customer—spec. information Customer : MAN BASIC SETTING : D2865LF03 1st speed Engine : 235.0 1st version kW Rated speed : 2000 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Spread Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 Spread assembly **Opening** : 207...210 pressure, bar Orifice plate 8.0: diameter mm 1st speed travel mm Test lines : 1 680 750 015 2nd speed travel mm Outside diameter 3rd speed x Wall thickness travel mm : 6.00x1.50x600 4th speed x Length mm travel mm 5th speed (A) Injection pump setting values travel mm Insp. values in parentheses Set equal delivery quant. per values

: 4.80...4.90 : (4.75...4.95) Rack travel in mm : 15.00...16.00 Firing order : 1-3-5-4-2 : 0-72-144-216-288 Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 5 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 4.40...4.60 & maximum rack tra: 15.0...16.0 Difference ° CS : 1.75...3.25 rpm: 900 Rack travel in mm : 13.10...13.20 Del.guantity cm3/: 25.7...25.9 100 s: (25.4...26.2) cm3 : 0.6100 s: (1.0) 2nd speed rpm : 325.0 Rack travel in mm : 5.9...6.3 Del.quantity cm3/ : 4.7...5.3 100 s: (4.4...5.6) cm3 : 1.0100 s: (1.4) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1045 : 7.70...7.90 rpm : 325 : 2.10...2.30 rpm : 500 : 4.10...4.50 rpm : 900 : 6.40...6.80 rpm : 1350 : 13.00...14.00 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1140

Rack travel in mm : 15.20...17.80

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Measurement FULL LOAD DELIV. AT FULL LOAD STOP  $1/\min : 900$ Speed 1st version 1st pressure hPa : -Rack travel in m: 9.00...9.20 Speed rpm : 900 Aneroid pressure h: 1200 2nd pressure hPa : 170 Rack travel in m: 9.40...9.50 Del.quantity : 257.0...259.0 1000 : (254.0...262.0) 3rd pressure hPa : 600 cm3 : 6.00 Rack travel in m: 11.90...12.10 Spread 1000 : (10.00) START CUT-OUT RATED SPEED 1/min: 245 (265) Speed 1st version FUEL DELIVERY CHARACTERISTICS Control lever position degrees: 283...291 Testing: 1st version 1st rack travel in: 11.70 Aneroid pressure h: 1200 rpm : 1000 rpm : 1040...1050 Speed Speed Del.quantity cm3/: 238.0...242.0 2nd rack travel in: 4.00 1000 s: (235.0...245.0) rpm : 1130...1160 Speed 4th rack travel in: 1350 Aneroid pressure h: 1200 Speed rpm : 650
Del.quantity cm3/: 259.0...265.0
1000 s: (256.0...268.0) Speed rpm : 0.00...1.00LOW IDLE 1 speed rpm : 650 Del.quantity cm3/ : 90.0...100.0 650 Control lever position degrees: 240...248 1000 s: (87.0...103.0) cm3 : 10.00Testina: Spread 1000 s: (14.0) Speed rpm Minimum rack trave: 7.50 Aneroid pressure h: rpm : 500 Speed : 325 rom Del.quantity cm3/ : 154.0...156.0 Rack travel in mm : 6.00...6.20 1000 s: (151.0...159.0) CONSTANT REGULATION : 340...450 Speed rpm **BREAKAWAY** TORQUE CONTROL 1st version Dimension a mm :? Torque control curve - 1st version 1mm rack travel less than rpm : 900 1st speed Rack travel in m: 13.10...13.20 ad speed rpm : 1000 full load rack tr: 11.70 rpm : 1040...1050 2nd speed Speed rpm Rack travel in m: 12.70...12.90 rpm : 650 3rd speed STARTING FUEL DELIVERY Rack travel in m: 12.40...12.60 4th speed rpm : 400 Rack travel in m: 11.60...11.90 : 100 Speed rpni Del.quantity cm3/: 180.0...200.0 1000 s: (176.0...204.0) Aneroid/Altitude Compensator Test LOW IDLE : 325 Speed 1st version rpm Rack travel in mm : 5.90...6.30 Setting Del.quantity cm3/: 47.0...53.0 : 900 Speed rpm 1000 s: (44.0...56.0) hPa : 1200 Pressure cm3 : 10.00: 13.10...13.20 Spread Rack travel mm

1000 s: (14.00)

Remarks:

: MAN-NR. 3-7048

Setting and blocking of pointer of start-of-delivery sensor on cyl. 5 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : CUM 8,3 t Test sheet Edition : 16.08.90 Replaces Test oil : ISO-4113 Combination no. : 0 402 736 805 Injection pump Pump designation : PES6P120A120RS7206 : 0 412 726 835 EP type number Governor Governor design. : RQV350..1100PA924-5K : 0 421 815 250 Governer no. Customer-spec. information : CUMMINS Customer Engine : 6CTAA : 202.0 1st version kW : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 047 Overflow quantity min. 1/h: 160...170 Test nozzle holder : 1 688 901 101 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008 Outside diameter x Wall thickness

: 6.00X2.00X600

(A) Injection pump setting values

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Insp. values in parentheses Set equal delivery quant.

: 3.50...3.60 Prestroke mm : (3.45...3.65) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing : 0.50 (0.75) Tolerance + - ° BASIC SETTING rpm : 11001st speed Rack travel in mm : 12.60...12.70 Del.quantity cm3/: 15.8...16.0 100 s: (15.5...16.3) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 350.0 Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 2.3...2.9 100 s: (2.1...3.1) cm3 : 0.5Spread 100 s: (0.9) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 350 : 1.10...1.50 travel mm rpm : 550 2nd speed travel mm : 3.40...4.00 rpm : 900 3rd speed travel mm 6.10...6.70 : 1150 4th speed rpm : 8.40...8.60 travel mm : 1250 5th speed rpm : 9.40...9.80 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1280 Rack travel in mm : 6.00...12.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1100Speed

Aneroid pressure h: 1200

x Length mm

: 158.0...160.0 Del.quantity 1000 : (155.0...163.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 111...119 Testing: 1st rack travel in: 11.60 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rpm : 1260...1290 Speed 4th rack travel in: 1350 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 71...79 Testing: Speed rpm Minimum rack trave: 7.30 rpm Rack travel in mm : 5.70...5.90 CONSTANT REGULATION rpm : 350...550 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 12.60...12.70 : 600 rpm 2nd speed Rack travel in m: 11.60...11.80 Rack travel in m: 12.20...12.40 Compensator Test 1st version Setting Speed : 1100 rpm hPa : 1200 Pressure : 12.60...12.70 Rack travel mm

3rd speed rpm : 800 Aneroid/Altitude Measurement 1/min: 1100 Speed 1st pressure hPa : -Rack travel in m: 8.40...8.60 2nd pressure hPa : 600 Rack travel in m: 11.60...11.70 3rd pressure hPa : 300 M03

Rack travel in m: 9.20...9.60 START CUT-OUT Speed 1/min : 270 (290) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 600 Del.quantity cm3/ : 174.0...180.0 1000 s: (171.0...183.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 105.0...109.0 1000 s: (103.0...111.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.60 rpm : 1140...1150 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 235.0...255.0 1000 s: (231.0...259.0) LOW IDLE Speed rpm : 350

Rack travel in mm : 5.70...5.90 Del.quantity cm3/: 23.0...29.0 1000 s: (21.0...31.0) cm3 : 5.00Spread 1000 s: (9.00)

Remarks:

: C.D.C. # 3281182 Start-of delivery mark/lock = 7.5° angular displacement of the cam after start of delivery of cylinder 1.

Note remarks

: CUM 5,9 W Test sheet : 08.08.90 Edition : 8.6.90 Replaces Test oil : ISO-4113

Combination no. : 0 402 736 806

Injection pump

Pump designation : PES6P110A12ORS7213

: 0 412 716 804 EP type number

Governor

Governor design. : RQV400...1250PA964-K Governor no. : 0 421 815 252

Customer-spec. information Customer : C.D.C.

Engine : 6BTA-A

: 171.5 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening .

pressure, bar : 207...210

Orifice plate

: 0,6 diameter mm

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50)

Rack travel in mm : 10.50

: 1-5- 3- 6- 2- 4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 15.50...15.60

Del.quantity cm3/: 16.5...16.7

100 s: (16.3...16.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 400.02nd speed

Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 3.3...3.7 100 s: (3.1...3.9)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 0.70...1.10 travel mm

rpm : 400 2nd speed

travel mm : 1.40...1.60

3rd speed rpm : 600

travel mm : 2.90...3.30

rpm : 1300 4th speed

travel mm : 7.20...7.40

: 1500 5th speed rpm

: 9.10...9.50 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250Speed

Aneroid pressure h: 1200

Del.quantity : 165.5...167.5 1000 : (163.5...169.5)

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED

1st version Control lever

position degrees: 57...65

Testina:

1st rack travel in: 14.50 Speed rpm : 1295...1305 2nd rack travel in: 4.00

rpm : 1475...1505 Speed

4th rack travel in: 1600

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 11...19

Testing:

: 275 Speed rpm Minimum rack trave: 7.20 : 400 rom

Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 15.50...15.60

: 800 rpm 2nd speed

Rack travel in m: 14.40...14.60

rpm : 700 3rd speed

Rack travel in m: 13.80...14.20

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 1250 rpm hPa : 1200 Pressure

Rack travel mm : 15.50...15.60

Measurement

1/min: 1250 Speed

1st pressure hPa : -

Rack travel in m: 7.60...8.00

2nd pressure hPa : 400

Rack travel in m: 9.70...9.80

3rd pressure hPa : 800

Rack travel in m: 13.40...13.80

START CUT-OUT

1/min : 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed rpm : 800

Del.quantity cm3/: 177.0...181.0 1000 s: (175.0...183.0)

cm3 : 8.00 Spread 1000 s: (12.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 82.5...86.5

1000 s: (80.5...88.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.50

rpm : 1295...1305 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 155.0...175.0

1000 s: (150.0...180.0)

Rack travel in mm : 12.00...13.00

LOW IDLE

: 400 Speed rpm

Rack travel in mm : 5.40...5.60 Del.quantity cm3/: 33.0...37.0 1000 s: (31.0...39.0)

cm3 : 8.00

Spread 1000 s: (12.00)

Remarks:

: C.D.C. # 3913440 Start-of-delivery mark 6° cam angle

after start of delivery cyl. 1

Note remarks

Test sheet : CUM 8,3 r : 05.10.90 Edition Replaces : 8.6.90 Test oil : ISO-4113

Combination no. : 0 402 736 807

Injection pump

Pump designation : PES6P110A120RS7214 : 0 412 716 805 EP type number

Governor

: RQV350...1100PA964-1 Governor design.

: 0 421 815 253 Governer no.

Customer-spec. information Customer : C.D.C.

: 6CTA-A Engine

: 201.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

: 0.6 diameter mm

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45

: (4.30...4.50)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm : 10501st speed

Rack travel in mm : 15.70...15.80

Del.quantity cm3/: 20.6...20.8

100 s: (20.4...21.0)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.6...5.8 Del.quantity cm3/ : 2.8...3.2

100 s: (2.6...3.4)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.80...2.00 travel mm

rpm : 450 2nd speed

travel mm : 3.10...3.50

3rd speed rpm : 600

: 5.10...5.50 travel mm

rpm : 1000 4th speed

: 8.10...8.30 travel mm

rpm : 1200 5th speed

: 9.60...10.00 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 1500

: 206.0...208.0 Del.quantity

1000 : (204.0...210.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 62...70

Testing:

1st rack travel in: 14.40

rpm : 1145...1155 Speed

2nd rack travel in: 4.00

rpm : 1310...1340 Speed

4th rack travel in: 1400

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 11...19

Testing:

: 275 Speed rpm Minimum rack trave: 7.20 rpm : 350

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 15.70...15.80

rpm : 650 2nd speed

Rack travel in m: 13.50...13.90

3rd speed rpm : 1100

Rack travel in m: 15.40...15.60

Aneroid/Altitude

Compensator Test

1st version

Setting

: 1050 Speed mgn

hPa : 1500 Pressure

: 15.70...15.80 Rack travel mm

Measurement

1/min: 1050 Speed

1st pressure hPa : -

Rack travel in m: 8.20...8.60

2nd pressure hPa : 340

Rack travel in m: 10.20...10.30

3rd pressure hPa : 840

Rack travel in m: 13.60...14.00

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 650 Del.quantity cm3/ : 198.5...202.5 1000 s: (196.5...204.5)

Spread cm3 : 8.001000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 98.0...102.0 1000 s: (96.0...104.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 14.40

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 160.0...180.0

1000 s: (155.0...185.0)

Rack travel in mm : 11.40...12.40

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 5.60...5.80

Del.quantity cm3/: 28.0...32.0

1000 s: (26.0...34.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3916627

Start-of-delivery mark = 5.5° after

start of delivery cyl. 1.

Bow dimension:

Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : CUM 5,9 w 1 Edition : 05.10.90

Replaces

: ISO-4113 Test oil

: 0 402 736 810 Combination no.

Injection pump

Pump designation : PES6P110A12ORS7213

: 0 412 716 804 EP type number

Governor

: RQV400...1250PA964-2 Governor design.

: 0 421 815 254 Governer no.

Customer-spec. information : C.D.C. Customer

: 6BTA-A Engine

: 141.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50)
Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 14.80...14.90

Del.quantity cm3/: 15.9...16.1

100 s: (15.7...16.3)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 400.02nd speed

Rack travel in mm: 5.4...5.6 Del.quantity cm3/: 3.3...3.7 100 s: (3.1...3.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 0.70...1.10 travel mm

2nd speed rpm : 400

1.40...1.60 travel mm

3rd speed : 600 rpm

: 2.90...3.30 : 1300 travel mm

4th speed rpm

: 7.20...7.40 travel mm

: 1500 5th speed rpm

: 9.10...9.50 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250Aneroid pressure h: 1200

Del.quantity : 159.0...163.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control Lever position degrees: 57...65

Testina:

1st rack travel in: 13.80 rpm : 1295...1305 Speed 2nd rack travel in: 4.00 rpm : 1455...1485 Speed

4th rack travel in: 1600 rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever position degrees: 11...19

Testing:

Speed rpm : 275 Minimum rack trave: 7.20 : 400 rpm

Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 1250 1st speed

Rack travel in m: 14.80...14.90

rpm : 800 2nd speed

Rack travel in m: 13.00...13.20

Aneroid/Altitude Compensator Test

1st version Setting

: 1250 Speed rpm hPa : 1200 Pressure

: 14.80...14.90 Rack travel mm

Measurement

1/min: 1250 Speed

1st pressure hPa : -

Rack travel in m: 8.20...8.60

2nd pressure hPa : 415

Rack travel in m: 10.20...10.30

3rd pressure hPa : 740

Rack travel in m: 13.00...13.40

START CUT-OUT

1/min : 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 800 Speed rpm

Del.quantity cm3/: 159.0...163.0 1000 s: (157.0...165.0)

cm3 : 8.00Spread 1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 95.5...99.5 1000 s: (93.5...101.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.80

rpm : 1295...1305 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 155.0...175.0

1000 s: (150.0...180.0)

Rack travel in mm : 12.00...13.00

LOW IDLE

: 400 Speed rpm

Rack travel in mm : 5.40...5.60 Del.quantity cm3/: 33.0...37.0 1000 s: (31.0...39.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3919090

Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

Note remarks

Test sheet : CUM 8,3 r 1 : 05.10.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 736 814

Injection pump

Pump designation : PES6P110A120RS7214

: 0 412 716 805 EP type number

Governor

: RQV350...1200PA964-6 Governor design.

: 0 421 815 258 Governer no.

Customer-spec. information Customer : C.D.C.

: 6CTA-A Engine

: 187.0 1st version kW Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test Lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50)

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 18.3...18.5

100 s: (18.1...18.7)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.6...5.8 Del.quantity cm3/ : 2.8...3.2

100 s: (2.6...3.4)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.80...2.00 travel mm

2nd speed rpm : 450

: 3.10...3.50 travel mm

rpm : 700 3rd speed

: 5.90...6.30 travel mm

rpm : 1200 4th speed

: 9.00...9.20 travel mm

rpm : 1400 5th speed

: 10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed Aneroid pressure h: 1200

Del.quantity : 183.0...185.0

1000 : (181.0...187.0)

Spread

cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 62...70

Testina:

1st rack travel in: 13.50

rpm : 1245...1255 Speed

2nd rack travel in: 4.00

rpm : 1405...1435 Speed

4th rack travel in: 1500

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 11...19

Testing:

Speed rpm

Minimum rack trave: 7.20 rpm

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

: 325...520 Speed rpm

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 1200 1st speed

Rack travel in m: 14.50...14.60

rpm : 650 2nd speed

Rack travel in m: 11.60...12.00

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rom : 1200

hPa : 1200 Pressure

Rack travel mm : 14.50...14.60

Measurement

1/min: 1200 Speed

1st pressure hPa : -

Rack travel in m: 7.70...8.10

2nd pressure hPa : 270

Rack travel in m: 9.50...9.60

3rd pressure hPa : 700 Rack travel in m: 12.60...13.00

START CUT-OUT

1/min: 265 (270) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 650 Speed rpm

Del.quantity cm3/: 168.5...172.5 1000 s: (166.5...174.5)

cm3 : 8.00Spread 1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 90.0...94.0 1000 s: (88.0...96.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.50

rpm : 1245...1255 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 140.0...160.0

1000 s: (135.0...165.0)

Rack travel in mm : 10.70...11.70

LOW IDLE

Speed rpm

Rack travel in mm : 5.60...5.80

Del.quantity cm3/: 28.0...32.0

1000 s: (26.0...34.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3917089

Start-of-delivery mark = 5.5° after

start of delivery cyl. 1.

Bow dimension:

Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: CUM 8,3 r 2 Test sheet : 05.10.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 736 816

Injection pump

Pump designation : PES6P110A120RS7214

: 0 412 716 805 EP type number

Governor

: RQV350...1200PA964-8 Governor design.

: 0 421 815 264 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6CTA-A

: 213.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm : (4.30...4.50)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 14.70...14.80

Del.quantity cm3/: 19.0...19.2

100 s: (18.8...19.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm: 5.6...5.8

Del.quantity cm3/: 2.8...3.2 100 s: (2.6...3.4)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 350 : 1.80...2.00 travel mm

rpm : 450 2nd speed

: 3.10...3.50 travel mm

rpm : 700 3rd speed

: 5.90...6.30 travel mm

rpm : 1200 4th speed

9.00...9.20 travel mm

rpm : 1400 5th speed

: 10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed Aneroid pressure h: 1200

: 190.0...192.0 Del.quantity

1000 : (188.0...194.0)

cm3 : 5.00Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 62...70 Testing: 1st rack travel in: 13.20 rpm : 1245...1255 Speed 2nd rack travel in: 4.00 rpm : 1400...1430 Speed 4th rack travel in: 1500 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 11...19 Testing: Speed rpm Minimum rack trave: 7.20 : 350 rpm Rack travel in mm : 5.60...5.80 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 14.70...14.80 rpm : 650 2nd speed Rack travel in m: 12.50...12.90 rpm : 1200 3rd speed Rack travel in m: 14.20...14.40 Aneroid/Altitude Compensator Test 1st version Setting

: 1100 Speed rom hPa : 1200 Pressure : 14.70...14.80 Rack travel mm Measurement 1/min: 1100 Speed 1st pressure hPa : -

Rack travel in m: 7.70...8.10 2nd pressure hPa : 260 Rack travel in m: 9.60...9.70 3rd pressure hPa : 710 Rack travel in m: 12.80...13.20 M13

START CUT-OUT

1/min: 265 (270) Speed

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1200

: 650 Speed ורכוז Del.quantity cm3/: 182.0...186.0 1000 s: (180.0...188.0)

cm3 : 8.00

Spread 1000 s: (12.0) Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 90.0...94.0 1000 s: (88.0...96.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.20

rpm : 1245...1255 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 140.0...160.0

1000 s: (135.0...165.0)

Rack travel in mm : 10.70...11.70

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.60...5.80 Del.quantity cm3/: 28.0...32.0 1000 s: (26.0...34.0)

cm3 : 8.00

Spread 1000 s: (12.00)

Remarks:

: C.D.C # 3916626

Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

Bow dimension:

Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : PER 12,2 d Test sheet : 31.07.90 : 7.2.89 Edition Replaces : ISO-4113 Phasing Test oil Combination no. : 0 402 746 835 Injection pump Pump designation : PES6P120A320RS7156 : 0 412 726 813 EP type number Governor Governor design. : RQV250...1050PA793-2 1st speed : 0 421 813 699 Governer no. Customer-spec. information : PERKINS Customer : EAGLE TX 350/375 Engine : 280.0 Spread 1st version kW : 2100 Rated speed TEST BENCH REQUIREMENTS 2nd speed Test oil inlet temp. °C : 38...42 Spread Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly 1st speed travel mm Openina : 207...210 2nd speed pressure, bar travel mm Orifice plate 3rd speed diameter mm : 0,8 travel mm 4th speed travel mm : 1 680 750 067 Test lines 5th speed travel mm Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm

: 4.50...4.60 : (4.45...4.65) Prestroke mm Rack travel in mm : 9.00...12.00 : 1-4-2-6-3-5 Firing order : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 900 Rack travel in mm : 14.20...14.30 Del.guantity cm3/: 27.7...27.9 100 s: (27.4...28.2) cm3 : 0.6100 s: (0.9) rpm : 250.0Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.3...1.7 100 s: (1.0...2.0) cm3 : 0.3 100 s: (0.6) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 : 0.90...1.30 rpm : 350 : 2.90...3.50 rpm : 700 : 4.00...4.60 rpm : 1000 : 7.40...7.60 rpm : 1100 : 8.80...9.20 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1070 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900

Aneroid pressure h: 1200

Speed

(A) Injection pump setting values

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Insp. values in parentheses Set equal delivery quant. Del.quantity : 277.0...279.0

1000 : (274.0...282.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 115...123

Testing:

1st rack travel in: 13.20 Speed rpm : 980...990

2nd rack travel in: 4.00

Speed rpm : 1080...1110

4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 81...89

Testing:

Speed rpm : 100 Minimum rack trave: 7.50 Speed rpm : 250

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

Speed rpm : 250...570

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 Pressure hPa : 1200

Rack travel mm : 14.20...14.30

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 12.20...12.30

2nd pressure hPa : 850

Rack travel in m: 13.80...13.90

3rd pressure hPa : 610

Rack travel in m: 12.60...12.80

START CUT-OUT

Speed 1/min: 170 (190)

BREAKAWAY

1st version

M15

1mm rack travel less than

full load rack tr: 13.20

Speed rpm : 980...990

STARTING FUEL DELIVERY

Speed rpm: 100

Del.quantity cm3/: 130.0...170.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 5.90...6.10

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.35...4.45 : (4.30...4.50) Note remarks Rack travel in mm : 9.00...12.00 Test sheet : FOR 7,8 k 1 Firing order : 1-5-3-6-2-4 : 05.10.90 Edition Replaces : ISO-4113 Test oil : 0-60-120-180-240-300 Phasing : D 402 746 863 Combination no. Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Injection pump Pump designation : PES6P120A720RS7179 Time to cyl. no. : 1 : 0 412 726 826 EP type number BASIC SETTING Governor Governor design. : RQV350..1150PA917K : 0 421 815 214 rpm : 11501st speed Governer no. Rack travel in mm : 14.00...14.10 Customer-spec. information : FNH Customer Del.guantity cm3/: 21.7...21.9 : 7.8L Engine 100 s: (21.4...22.2) : 201.0 1st version kW : 2300 cm3 : 0.7Rated speed Spread 100 s: (1.1) TEST BENCH REQUIREMENTS rpm : 350.02nd speed Test oil inlet temp. °C : 38...42 Rack travel in mm: 5.0...5.4 Del.quantity cm3/: 2.0...2.6 Overflow valve 100 s: (1.8...2.8) : 2 417 413 072 cm3 : 0.5Spread 100 s: (0.9) Overflow quantity min. 1/h: 160...170 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 103 GUIDE SLEEVE TRAVEL assembly rpm : 1215 1st speed travel mm : 9.40...9.60 0pening 2nd speed : 207...210 350 pressure, bar : 2.20...2.40 rpm : 450 rpm : travel mm Orifice plate 3rd speed : 3.40...4.00 diameter mm : 0,7 travel mm rpm : 800 4th speed : 6.10...6.50 travel mm : 1 680 750 008 rpm : 1550 5th speed Test lines : 13.00...14.00 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00x2.00x600 Control-lever position x Length mm Degree: -1 rpm : 1380 (A) Injection pump setting values Speed Insp. values in parentheses Rack travel in mm : 6.00...13.00 Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values

1st version

Speed

rpm : 1150

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Aneroid pressure h: 1400 : 217.0...219.0 Del.quantity 1000 : (214.0...222.0) : 7.00 Spread cm3 1000 : (11.00) RATED SPEED 1st version Control lever position degrees: 116...124 Testing: 1st rack travel in: 13.00 rpm : 1210...1220 Speed 2nd rack travel in: 4.00 rpm : 1345...1375 Speed 4th rack travel in: 1450 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 64...72 Testing: rpm : 100 Speed Minimum rack trave: 6.70 rpm : 350 Rack travel in mm : 5.00...5.40 CONSTANT REGULATION rpm : 320...440 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 1150 1st speed Rack travel in m: 14.00...14.10 rpm : 750 2nd speed Rack travel in m: 12.40...12.60 3rd speed rpm : 550 Rack travel in m: 11.30...11.70 Aneroid/Altitude Compensator Test 1st version Settina : 1150 Speed rpm hPa : 1400 Pressure : 14.00...14.10 Rack travel mm Measurement 1/min: 1150 Speed 1st pressure hPa : -Rack travel in m: 7.90...8.30 2nd pressure hPa : 300 Rack travel in m: 9.50...9.60

3rd pressure hPa : 850 Rack travel in m: 12.40...12.80 START CUT-OUT 1/min : 290 (310) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 rpm : 750 Speed Del.quantity cm3/: 212.0...218.0 1000 s: (209.0...221.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 110.0...114.0 1000 s: (108.0...116.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.00 rpm : 1210...1220 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 150.0...180.0 1000 s: (145.0...185.0) Rack travel in mm : 10.90...11.50 Remarks: Bow dimension: Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MAC 11,1 e6 Test sheet Edition : 02.05.90 Replaces : 28.9.89

: ISO-4113 Test oil

Combination no. : 0 402 746 869

Injection pump

Pump designation : PES6P120A720RS7164

: 0 412 726 816 EP type number

Governor

: RQV325...875PA848-29 Governor design.

: 0 421 815 220 Governer no.

Customer-spec. information

: MACK TRUCKS Customer

: EMC6 250L 4VH Engine

: 196.0 1st version kW : 1750 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm

: 2.75...2.85 : (2.70...2.90)

Rack travel in mm : 12.00...13.00

Firing order : 1-5-3-6-2-

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 875 1st speed

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 18.4...18.6

100 s: (18.2...18.8)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm: 4.7...4.9 Del.quantity cm3/: 3.9...4.5

100 s: (3.7...4.7)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

1.20...1.40 travel mm

450 2nd speed man

: 2.80...3.20 travel mm

: 850 3rd speed rpm

: 6.20...6.40 travel mm

: 1000 4th speed rpm

: 7.70...7.90 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 875 Speed Aneroid pressure h: 900

: 184.0...186.0 Del.quantity

1000 : (182.0...188.0) : 5.00 Spread cm3

1000 : (9.00)

## RATED SPEED

1st version Control Lever

position degrees: 55...63

Testing:

1st rack travel in: 12.00 Speed rpm : 915...925 2nd rack travel in: 4.00

rpm : 1035...1065 Speed

4th rack travel in: 1150

rpm : 0.00...1.00Speed

LOW IDLE 1

Control Lever

position degrees: 10...18

Testing:

: 275 Speed rpm Minimum rack trave: 5.90 rpm : 325

Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 875

Rack travel in m: 13.00...13.10

: 510 2nd speed rpm

Rack travel in m: 14.90...15.10

rpm : 650 3rd speed

Rack travel in m: 13.90...14.20

rpm : 450 4th speed

Rack travel in m: 0.00...14.70

Aneroid/Altitude

Compensator Test

1st version

Setting

: 510 Speed rpm Pressure hPa : 900

: 14.90...15.10 Rack travel mm

Measurement

Speed  $1/\min : 510$ 

1st pressure hPa : -

Rack travel in m: 10.40...10.80

2nd pressure hPa : 205

Rack travel in m: 11.70...11.80

3rd pressure hPa : 460

Rack travel in m: 13.90...14.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

: 510 Speed man Del.quantity cm3/: 252.0...258.0

1000 s: (250.0...250.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: 900

Speed rpm : 875 Del.quantity cm3/ : 179.0...181.0 \* 1000 s: (151.0...173.5)

Aneroid pressure h: -

Speed : 400 rpm

Del.guantity cm3/: 152.0...156.0

1000 s: (150.0...158.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

rpm : 915...925 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 160.0...200.0

1000 s: (150.0...210.0) Rack travel in mm : 10.40...10.80

LOW IDLE

Speed rpm

Rack travel in mm : 4.70...4.90 Del.quantity cm3/: 39.0...45.0 1000 s: (37.0...47.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MACK # 313GC5181P4

Delivery-valve spring pre-tension 3.0...3.2 mm.

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAC 12,0 c3 : 02.05.90 Edition : 28.9.89 Replaces : ISO-4113 Test oil Combination no. : 0 402 746 876 Injection pump Pump designation : PES6P120A720RS7157 : 0 412 726 814 EP type number Governor Governor design. : RQV325...850PA929-3K : 0 421 815 232 Governer no. Customer-spec. information : MACK TRUCKS Customer : E7-300 4VH Engine : 220.0 1st version kW : 1750 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 011 Overflow quantity min. 1/h: 160...170 Test nozzle holder assembly : 1 688 901 101 Openina pressure, bar : 207...210 Orifice plate diameter mm : 0,6 : 1 680 750 008 Test lines

Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 17...19

: 2.75...2.85 Prestroke mm : (2.70...2.90)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no.

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 20.4...20.6

100 s: (20.2...20.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.02nd speed Rack travel in mm: 4.7...4.9

Del.quantity cm3/: 4.0...4.6 100 s: (3.8...4.8)

cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

Spread

rpm : 325 1st speed

1.20...1.40 travel mm : 450

2nd speed rpm

: 2.80...3.20 travel mm

3rd speed rpm : 650

: 5.60...5.80 travel mm

rpm : 900 4th speed

: 8.30...8.50 travel mm : 1100 5th speed

man : 10.30...10.80 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850 Aneroid pressure h: 1200

Del.quantity : 204.0...200... 1000 : (202.0...208.0)

: 5.00 Spread cm3 : (9.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 51...59

Testina:

1st rack travel in: 11.20

Speed rpm : 890...900 2nd rack travel in: 4.00

rpm : 1040...1070 Speed

4th rack travel in: 1150

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 7...15

Testina:

Speed : 275 rpm

Minimum rack trave: 6.30

Speed rpm : 325

Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 12.20...12.30

2nd speed rpm : 600

Rack travel in m: 12.50...12.70 3rd speed rpm : 500

Rack travel in m: 0.00...11.10

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 1200

Rack travel mm : 12.50...12.70

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 7.70...8.10

2nd pressure hPa : 265

Rack travel in m: 9.00...9.10

3rd pressure hPa : 565

Rack travel in m: 11.20...11.60

START CUT-OUT

1/min: 275 (285) Speed

M21

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 600 Speed rpm

Del.quantity cm3/: 241.0...247.0 1000 s: (239.0...249.0)

: 8.00 cm3 Spread

1000 s: (12.0) Aneroid pressure h: 1200

Speed rpm

Del.quantity cm3/: 159.0...161.0 \*

1000 s: (136.5...157.0)

Aneroid pressure h: -

rpm : 400 Speed

Del.quantity cm3/: 148.0...152.0 1000 s: (146.0...154.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.20

rpm : 890...900 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 180.0...220.0

1000 s: (170.0...230.0)

Rack travel in mm : 10.00...10.60

LOW IDLE

rpm : 325 Speed

Rack travel in mm : 4.70...4.90

Del.quantity cm3/: 40.0...46.0 1000 s: (38.0...48.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MACK # 313GC5185-P22

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : PER 12,2 f1 : 17.09.90 Edition Replaces : ISO-4113 Test oil Combination no. : 0 402 746 882 Injection pump Pump designation: PES6P120A320RS7156-1 EP type number : 0 412 726 830 Governor Governor design. : RQV350..1050PA941-1 : 0 421 813 887 Governer no. Customer-spec. information Customer : PERKINS : 2006 TW-H Engine TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 067 Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 4.50...4.60

Rack travel in mm : 9.00...12.00

: (4.45...4.65)

: 1- 4- 2- 6- 3- 5 Firing order : 0-60-120-180-240-300 Phasing : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 1 BASIC SETTING 1st speed rpm : 1050Rack travel in mm : 14.00...14.10 Del.guantity cm3/: 26.9...27.1 100 s: (26.6...27.4) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 350.0Rack travel in mm : 8.3...8.5 Del.quantity cm3/: 6.3...6.9 100 s: (6.1...7.1) cm3 : 0.8Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed 350 rom : : 0.80...1.20 travel mm 2nd speed : 420 rpm : 3.60...4.20 travel mm 3rd speed : 700 rpm : 4.70...5.30 travel mm : 1120 4th speed rpm 5.50...5.70 travel mm : 1250 5th speed rpm : 8.70...9.10 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 800 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1050 Aneroid pressure h: 1200 Del.quantity : 207.0...274.0)

Prestroke mm

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 98...106

Testing:

1st rack travel in: 13.00

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1180...1210 Speed

4th rack travel in: 1300

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 70...78

Testing:

Speed rpm : 200 Minimum rack trave: 10.00 rpm : 350

Rack travel in mm : 8.30...8.50

CONSTANT REGULATION

Speed rpm : 350...420

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 hPa : 1200 Pressure

: 14.00...14.10 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 11.20...11.40

2nd pressure hPa : 710

Rack travel in m: 13.10...13.20

3rd pressure hPa : 560

Rack travel in m: 11.80...12.00

START CUT-OUT

1/min: 300 (320) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed rom : 600

M23

Del.quantity cm3/: 275.0...281.0

1000 s: (272.0...284.0) cm3 : 8.00

Spread

1000 s: (12.)

Aneroid pressure h: rpm : 600 Speed

Del.quantity cm3/: 182.0...184.0 1000 s: (179.0...187.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.00

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 185.0...225.0

1000 s: (181.0...229.0)

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : RVI 6,2 h : 28.09.90 Edition Replaces : ISO-4113 Test oil : 0 402 746 883 Combination no. Injection pump Pump designation : PES6P110A320RS7198 EP type number : 0 412 716 802 Governor : RQV275...1250PA942K Governor design. : 0 421 815 234 Governer no. Customer-spec. information Customer : RVI : MIDRO6-06-26 Engine : 132.5 1st version kW : 2500 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Openina pressure, bar : 172...175 : 1 680 750 015 Test lines Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 4.60...4.70

Rack travel in mm : 12.50...13.50

: (4.55...4.75)

: 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 14.00...15.00 & maximum rack tra: 20.0...21.0 Difference ° CS : 2.50...4.00 BASIC SETTING rpm: 1250 1st speed Rack travel in mm : 14.50...14.60 Del.quantity cm3/: 15.3...15.5 100 s: (15.0...15.7) cm3 : 0.4Spread 100 s: (0.7) rpm : 275.0 2nd speed Rack travel in mm : 5.0...5.4 Del.quantity cm3/: 1.8...2.3 100 s: (1.5...2.5) cm3 : 0.4Spread 100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1320 9.70...9.90 travel mm : 275 2nd speed rpm : 0.90...1.10 travel mm 3rd speed rpm : 600 : 4.20...4.60 travel mm rpm : 1000 4th speed : 7.10...7.50 travel mm : 1600 5th speed rpm : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1370Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP

Prestroke mm

2nd pressure hPa : 360 Rack travel in m: 12.80...12.90 1st version Speed rpm : 1250 Aneroid pressure h: 1000 3rd pressure hPa : 220 Rack travel in m: 11.80...12.20 : 153.0...155.0 Del.quantity 1000 : (150.5...157.5) Spread cm3 : 4.00 START CUT-OUT 1000 : (7.50) 1/min : 215 (235) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 110...118 1st version Aneroid pressure h: 1000 rpm : 750 Testing: Speed Del.quantity cm3/: 119.0...123.0 1000 s: (116.0...126.0) 1st rack travel in: 13.50 rpm : 1315...1325 Speed Aneroid pressure h: -2nd rack travel in: 4.00 rpm : 1475...1505 Speed rpm : 750 Del.quantity cm3/: 54.0...64.0 Speed 4th rack travel in: 1600 1000 s: (51.0...67.0) rpm : 0.00...1.00Speed cm3 : 8.00 Spread 1000 s: (-) LOW IDLE 1 Aneroid pressure h: -Control lever : 750 position degrees: 58...66 Speed rom Del. quantity cm3/: 34.0...44.0 1000 s: (31.0...47.0) Testing: cm3 : 8.00 1000 s: (-) : 200 Speed Spread rpm Minimum rack trave: 6.00 Aneroid pressure h: rpm : 275 Rack travel in mm : 5.10...5.30 rpm : 500 Speed Del.quantity cm3/: 67.0...69.0 1000 s: (64.5...71.5) CONSTANT REGULATION rpm : 350...480 Speed **BREAKAWAY** TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version 1st version : 1250 1mm rack travel less than 1st speed rpm Rack travel in m: 14.50...14.60 rpm : 750 2nd speed full load rack tr: 13.50 rpm : 1315...1325 Rack travel in m: 13.60...13.80 Speed 3rd speed rpm : 400 Rack travel in m: 12.80...-13.20 STARTING FUEL DELIVERY Aneroid/Altitude Compensator Test Speed rpm : 100 Del.quantity cm3/: 85.0...115.0 1000 s: (81.0...119.0) 1st version Setting LOW IDLE : 1250 Speed rpm Speed rpm : 275
Rack travel in mm : -9.10...-9.50 hPa : 1000 Pressure Rack travel mm : 14.50...14.60 Del.quantity cm3/: 18.0...23.0 1000 s: (15.5...25.5) Measurement cm3 : 4.501/min: 1250 Spread Speed 1000 s: (7.50) 1st pressure hPa : -Rack travel in m: 11.20...11.60 Remarks:

M25

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MAC 12,0 h3 Test sheet : 05.10.90 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 746 887

Injection pump

Pump designation : PES6P120A720RS7200

: 0 412 726 833 EP type number

Governor

Governor design. : \$\$325...975PA944-2K

: 9 321 815 237 Governer no.

Customer-spec. information

: MACK TRUCKS Customer

: E7-300A Engine

1st version kW : 224.0 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 11.00...13.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 975 1st speed

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 22.5...22.7

100 s: (22.3...22.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.02nd speed

Rack travel in mm: 4.8...5.0 Del.quantity cm3/: 4.0...4.6

100 s: (3.8...4.8)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.40...1.60 travel mm

rpm : 450 2nd speed

: 2.80...3.20 travel mm

rpm : 950 3rd speed

: 7.90...8.10 travel mm

: 1200 4th speed rpm

: 10.20...10.60 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 975 Speed

Aneroid pressure h: 1200

: 225.0...227.0 Del.quantity

1000 : (223.0...229.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control lever position degrees: 57...65 Testina: 1st rack travel in: 12.00 rpm : 1015...1025 Speed 2nd rack travel in: 4.00 Speed rpm: 1170...1200 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 8...16 Testina: Speed rom Minimum rack trave: 6.00 rpm : 325 Speed Rack travel in mm : 4.80...5.00 CONSTANT REGULATION Speed rpm : 325...520 TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version rpm : 975 1st speed Rack travel in m: 13.00...13.10 2nd speed rpm : 600 Rack travel in m: 12.10...12.30 3rd speed rpm : 500 Rack travel in m: 11.30...11.70 Aneroid/Altitude Compensator Test 1st version Setting : 975 Speed rpm hPa : 1200 Pressure : 13.00...13.10 Rack travel mm Measurement 1/min: 975 Speed 1st pressure hPa : -Rack travel in m: 7.90...8.30 2nd pressure hPa : 325 Rack travel in m: 9.40...9.50 3rd pressure hPa : 640 Rack travel in m: 11.60...12.00 START CUT-OUT

1/min: 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1200 : 600 Speed rpm Del.quantity cm3/: 241.5...245.5 1000 s: (239.5...247.5) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/ : 149.0...153.0 1000 s: (147.0...155.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.00 : 1015...1025 Speed rom STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 190.0...230.0 1000 s: (180.0...240.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.80...5.00 Del.quantity\_cm3/: 40.0...46.0 1000 s: (38.0...48.0) cm3 : 8.00Spread 1000 s: (12.00) Remarks: : MACK # 313GC5188-P8 Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: MAC 12,0 h4 Test sheet : 17.09.90 Edition

Replaces

Test oil : ISO-4113

: 0 402 745 891 Combination no.

Injection pump

Pump designation : PES6P120A720RS7200

: 0 412 726 833 EP type number

Governor

Governor design.: RQV325...875PA944-6K

: 0 421 815 241 Governer no.

Customer-spec. information

Customer : MACK TRUCKS

Engine : EM7-250

1st version kW : 187.0 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test rozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 3.25...3.35 : (3.20...3.40) Prestroke mm

Rack travel in mm : 11.00...13.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 875 1st speed

Rack travel in mm : 12.50...12.60

Del.guantity cm3/: 21.5...21.7

100 s: (21.3...21.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.02nd speed

Rack travel in mm: 4.8...5.0

Del.quantity cm3/: 4.0...4.6 100 s: (3.8...4.8)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.40...1.60 travel mm

: 450 2nd speed rpm

3.30...3.70 travel mm

700 3rd speed rpm

: 7.90...8.30 travel mm

: 900 4th speed rpm

: 9.40...9.60 travel mm

: 1050 5th speed rpm

: 10.60...11.00 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 213.0...219.0)

Spread cm3 : 5.00

1000 : (9.00) RATED SPEED 1st version

Control lever position degrees: 60...68

Testing:

1st rack travel in: 11.50 rpm : 915...925 Speed 2nd rack travel in: 4.00

rpm : 1035...1065 Speed

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 8...16

Testina:

Speed rpm : 275 Minimum rack trave: 6.00 Speed rpm : 325

Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

: 325...520 Speed rom

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 875 1st speed

Rack travel in m: 12.50...12.60

rpm : 510 2nd speed

Rack travel in m: 13.40...13.60

rpm : 600 3rd speed

Rack travel in m: 13.40...13.60

4th speed rpm : 450

Rack travel in m: 12.70...13.10

Aneroid/Altitude Compensator Test

1st version

Setting

: 510 Speed rom hPa : 1200 Pressure

: 13.40...13.60 Rack travel mm

Measurement

1/min: 510 Speed

1st pressure hPa : -

Rack travel in m: 8.60...9.00

2nd pressure hPa : 285 Rack travel in m: 10.00...10.10

3rd pressure hPa : 570

Rack travel in m: 12.10...12.50

START CUT-OUT

1/min : 250 (255) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rpm\_ : 510 Speed

Del.quantity cm3/: 292.5...296.5 1000 s: (290.5...298.5)

cm3 : 8.00Spread

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 400 Dei.quantity cm3/ : 153.0...157.0

1000 s: (151.0...159.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.50

Speed rpm : 915...925

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 190.0...230.0

1000 s: (180.0...240.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

rpm : 325 Speed

Rack travel in mm : 4.80...5.00

Del.quantity cm3/: 40.0...46.0

1000 s: (38.0...48.0)

cm3 : 8.00

Spread

1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P2

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet Edition

: MAC 12,0 h5 : 05.10.90

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 746 892

Injection pump

Pump designation : PES6P120A720RS7200

EP type number

: 0 412 726 833

Governor

Governor design. : RQV325...975PA944-7K Governer no. : 0 421 815 242

Customer-spec. information Customer

: MACK TRUCKS

Engine

: E7-250A

1st version kW

: 180.0

Rated speed

: 1950

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

assembly

: 1 688 901 101

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,6

Test lines

: 1 680 750 008

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm

: 3.25...3.35 : (3.20...3.40)

Rack travel in mm : 11.00...13.00

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed

rpm: 975

Rack travel in mm : 12.30...12.40

Del.guantity cm3/: 20.5...20.7

100 s: (20.3...20.9)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 325.0

Rack travel in mm: 4.8...5.0

Del.quantity cm3/ : 4.0...4.6 100 s: (3.8...4.8)

Spread

cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.40...1.60 travel mm

rpm : 450 2nd speed

travel mm

: 2.80...3.20

3rd speed

: 950 rpm

: 7.90...8.10

travel mm 4th speed

: 1200 rpm

travel mm

: 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 975

Aneroid pressure h: 1200

Del.quantity : 200.3...209.5)

cm3 : 5.00 1000 : (9.00)

RATED SPEED

Spread

1st version Control lever position degrees: 54...62 Testing: 1st rack travel in: 11.30 rpm : 1015...1025 Speed 2nd rack travel in: 4.00 Speed rpm : 1165...1195 4th rack travel in: 1300 rom : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 8...16 Testing: Speed : 275 rpm Minimum rack trave: 6.00 rpm Speed Rack travel in mm : 4.80...5.00 CONSTANT REGULATION : 325...520 Speed rom TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 975 1st speed Rack travel in m: 12.30...12.40 rpm : 600 2nd speed Rack travel in m: 12.20...12.40 rpm : 800 3rd speed Rack travel in m: 12.40...12.60 th speed rpm : 500 Rack travel in m: 11.40...11.80 4th speed Aneroid/Altitude Compensator Test 1st version Setting : 975 Speed rpm hPa : 1200 Pressure Rack travel mm : 12.30...12.40 Measurement 1/min: 975 Speed 1st pressure hPa : -Rack travel in m: 8.80...9.20 2nd pressure hPa : 340 Rack travel in m: 9.80...9.90 3rd pressure hPa : 600 Rack travel in m: 11.50...11.90 START CUT-OUT 1/min: 250 (255) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 600 Speed rpm

Del.quantity cm3/: 234.0...238.0

1000 s: (232.0...240.0)

cm3 : 8.00Spread

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 400 Del.quantity cm3/: 157.5...161.5 1000 s: (155.5...163.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.30

: 1015...1025 Speed rpm

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 190.0...230.0

1000 s: (180.0...240.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325 Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 40.0...45.0 1000 s: (38.0...48.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P6

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

NO4

: 4.80...4.90 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (4.75...4.95) Rack travel in mm : 12.50...13.50 Firing order : 1-5-3-6-2-4 Note remarks : RVI 9,8 L Test sheet : 28.09.90 Edition : 6.7.90 Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasing Tolerance + - ° : 0.50 (0.75) : 0 402 746 893 Combination no. BEGINNING OF DELIVERY DIFFERENCE Injection pump Pump designation : PES6P120A320RS7201 betw. rack trav. m: 12.50...13.50 EP type number : 0 412 726 834 & maximum rack tra: 20.0...21.0 Governor Governor design. : RQV275...1000PA948 Difference ° CS : 2.25...3.75 : 0 421 813 852 Governer no. BASIC SETTING Customer-spec. information Customer 1st speed rpm: 1000 : RVI Rack travel in mm : 13.90...14.00 : MIDR 062045Q Engine Del.quantity cm3/: 23.3...23.5 1st version kW : 176.5 Rated speed : 2000 100 s: (23.0...23.8) TEST BENCH REQUIREMENTS cm3 : 0.5Spread Test oil 100 s: (0.9) inlet temp. °C : 38...42 rpm : 275.0Overflow valve 2nd speed Rack travel in mm : 5.4...5.8 : 1 417 413 025 Del.quantity cm3/: 3.1...3.7 100 s: (2.8...4.0) Inlet press., bar: 1.50 cm3 : 0.8 Spread 100 s: (1.2) Test nozzle holder : 1 688 901 019 assembly (B) Setting of injection pump with governor Opening . : 207...210 pressure, bar GUIDE SLEEVE TRAVEL rpm : 10001st speed Orifice plate : 7.60...7.80 travel mm diameter mm : 0,8 rpm : 275 2nd speed : 1.10...1.80 travel mm rpm : 500 Test lines : 1 680 750 075 3rd speed : 3.70...4.10 travel mm rpm : 770 Outside diameter 4th speed : 5.90...6.30 x Wall thickness travel mm : 8.00x2.50x1000 rpm : 1400 5th speed x Length mm : 11.00...12.00 travel mm (A) Injection pump setting values GUIDE SLEEVE POSITION Insp. values in parentheses

GUIDE SLEEVE POSITION
Control-lever position
Degree: -1
Speed rpm : 1060
Rack travel in mm : 15.20...17.80

Set equal delivery quant.

per values

Test pressure, bar: 25...27

BEGINNING OF DELIVERY

1st version rpm : 1000 Speed Aneroid pressure h: 900 Del.quantity : 233.0...235.0 1000 : (230.0...238.0) cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Control lever position degrees: 296...304 Testing: 1st rack travel in: 12.90 rpm : 1065...1u75 Speed 2nd rack travel in: 4.00 rpm : 1200...1230 Speed 4th rack travel in: 1300 rom : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 244...252 Testing: Speed : 200 rpm Minimum rack trave: 6.90 Speed rpm Rack travel in mm : 5.50...5.70 CONSTANT REGULATION : 310...420 Speed rpm Aneroid/Altitude Compensator Test 1st version Settina Speed rpm : 500 Pressure hPa : 900 Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 10.60...11.00 2nd pressure hPa : 560 Rack travel in m: 13.10...13.30 3rd pressure hPa : 240 Rack travel in m: 11.50...11.90 START CUT-OUT 1/min: 225 (245) Speed

1st version Aneroid pressure h: 900 : 500 Speed rpm Del.quantity cm3/: 239.0...245.0 1000 s: (236.0...248.0) Aneroid pressure h: : 500 Speed rpm Del.quantity cm3/: 92.0...102.0 1000 s: (89.0...105.0) cm3 : 10.00Spread 1000 s: (-) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 135.0...137.0 1000 s: (132.0...140.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.90 Speed rpm : 1065...1075 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 150.0...180.0 1000 s: (146.0...184.0) LOW IDLE Speed rpm : 275

Speed rpm : 275
Rack travel in mm : -8.10...-8.50
Del.quantity cm3/ : 31.0...37.0
1000 s: (28.0...40.0)
Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

N06

FUEL DELIVERY CHARACTERISTICS

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : RVI 6,2 i : 28.09.90 Edition Replaces : ISO-4113 Test oil Combination no. : 0 402 746 894 Injection pump Pump designation : PES6P110A320RS7208 : 0 412 716 803 EP type number Governor : RQV275...1175PA942-1 Governor design. : 0 421 815 244 Governer no. Customer—spec. information Customer : RVI : MIDRO60226 M Engine : 210.0 1st version kW : 2350 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test wzzle holder : 0 681 343 009 as sembly Opening pressure, bar : 172...175 Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

: 4.10...4.20

; (4.05...4.25)

per values

Test pressure, bar: 25...27

BEGINNING OF DELIVERY

Prestroke mm

Rack travel in mm : 13.00...14.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 14.00...14.10 & maximum rack tra: 20.0...21.0 Difference ° CS : 2.75...4.25 BASIC SETTING rpm: 1175 1st speed Rack travel in mm : 14.00...14.10 Del.quantity cm3/: 17.1...17.3 100 s: (16.8...17.5) cm3 : 0.4Spread 100 s: (0.7) 2nd speed rpm : 275.0 Rack travel in mm : 4.8...5.2 Del.guantity cm3/: 1.8...2.3 100 s: (1.5...2.5) cm3 : 0.4 Spread 1 (2) s: (0.7)(B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1320 : 9.70...9.90 travel mm rpm : 275 2nd speed : 0.90...1.10 travel mm 3rd speed rpm : 600 : 4.20...4.60 travel mm rpm : 1000 4th speed : 7.10...7.50 travel mm rpm : 1600 5th speed : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1370 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP

Rack travel in m: 10.10...10.50 1st version 2nd pressure hPa : 520 rpm : 1175 Rack travel in m: 12.30...12.40 Speed Aneroid pressure h: 1000 3rd pressure hPa : 240 Rack travel in m: 10.90...11.30 Del.quantity : 171.0...173.0 1000 : (168.5...175.5) cm3 : 4.00 1000 : (7.50) START CUT-OUT Spread 1/min: 215 (235) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 110...118 1st version Aneroid pressure h: 1000 : 700 Speed Testing: rpm Del.quantity cm3/: 147.0...153.0 1000 s: (144.0...156.0) 1st rack travel in: 13.00 rpm : 1245...1255 Speed 2nd rack travel in: 4.00 Aneroid pressure h: : 700 rpm : 1420...1450 Speed rpm Speed Del.quantity cm3/ : 50.0...60.0 4th rack travel in: 1600 1000 s: (47.0...63.0) rpm : 0.00...1.00Speed cm3 : 8.00Spread 1000 s: (-) LOW IDLE 1 Control lever Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 69.0...71.0 position degrees: 56...64 1000 s: (66.5...73.5) Testing: Speed : 200 rpm Minimum rack trave: 5.70 : 275 **BREAKAWAY** rpm Rack travel in mm : 4.90...5.10 1st version CONSTANT REGULATION 1mm rack travel less than rpm : 350...480 Speed full load rack tr: 13.00 rpm : 1245...1255 TORQUE CONTROL Speed Dimension a mm :? Torque control curve - 1st version STARTING FUEL DELIVERY rpm : 1175 1st speed Rack travel in m: 14.00...14.10 2nd speed rpm : 700 Speed rpm : 100 Del.quantity cm3/: 85.0...115.0 1000 s: (81.0...119.0) Rack travel in m: 13.20...13.40 d speed rpm : 400 3rd speed rpm Rack travel in m: 12.40...12.80 LOW IDLE Aneroid/Altitude rpm : 275 Compensator Test Speed Rack travel in mm : -8.80...-9.20 Del.quantity cm3/: 18.0...23.0 1000 s: (15.5...25.5) 1st version cm3 : 4.50Spread Setting 1000 s: (7.50) Speed : 1175 rom hPa : 1000 Pressure Rack travel mm : 14.00...14.10 Remarks: Measurement 1/min: 1175 Setting and blocking of pointer of beed start-of-delivery sensor on cyl. 1 1st pressure hPa : start of delivery

N08

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAC 12,0 h2 : 17.09.90 Edition : 8.8.90 Replaces : ISO-4113 Test oil : 0 402 746 896 Combination no. Injection pump : PES6P120A720RS7200 Pump designation : 0 412 726 833 EP type number Governor : RQV325...900PA944-11 Governor design. : 0 421 815 260 Governer no. Customer-spec. information Customer : MACK TRUCKS Engine : E7-350 : 261.0 1st version kW Rated speed : 1800 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 011 Overflow quantity min. 1/h: 160...170 Test nozzle holder : 1 688 901 101 assembly **Opening** pressure, bar : 207...210 Orifice plate : 0,6 diameter mm : 1 680 750 008 Test lines Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24 : 2.75...2.85 Prestroke mm : (2.70...2.90) Rack travel in mm : 11.00...13.00 Firing order : 1-5-3-6-2-4 : 0-60-120-180-240-300 Phasing Phasing : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 900 Rack travel in mm : 14.50...14.60 Del.quantity cm3/: 27.7...27.9 100 s: (27.5...28.1) cm3 : 0.5Spread 100 s: (0.9) rpm : 325.02nd speed Rack travel in mm: 4.8...5.0 Del.quantity cm3/: 4.0...4.6 100 s: (3.8...4.8) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 325 1st speed 1.40...1.60 travel mm rpm : 450 2nd speed : 2.80...3.20 travel mm 3rd speed rpm : 700 : 6.00...6.40 travel mm rpm : 900 4th speed : 8.50...8.70 travel mm rpm : 1050 5th speed : 9.80...10.20 travel mm FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 900 Speed Aneroid pressure h: 1200 : 277.5...279.5 Del.quantity 1000 : (275.5...281.5) : 5.00

cm3

1000

: (9.00)

Spread

RATED SPEED

1st version

Control lever

position degrees: 59...67

Testing:

1st rack travel in: 13.50 Speed rpm : 940...950 2nd rack travel in: 4.00

rpm : 1105...1135 Speed

4th rack travel in: 1200

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 8...16

Testing:

Speed : 275 rpm Minimum rack trave: 6.00 rpm : 325

Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 900

Rack travel in m: 14.50...14.60

: 625 2nd speed rpm

Rack travel in m: 13.60...13.80

3rd speed rpm : 800

Rack travel in m: 14.00...14.20

4th speed rpm : 675

Rack travel in m: 13.60...13.80

5th speed rpm : 500 Rack travel in m: 11.90...12.30

Aneroid/Altitude

Compensator Test

1st version

Setting

: 900 Speed rpm hPa : 1200 Pressure

: 14.50...14.60 Rack travel mm

Measurement

Speed 1/min: 900

1st pressure hPa : -

Rack travel in m: 8.00...8.40

2nd pressure hPa : 400

Rack travel in m: 9.80...9.90

3rd pressure hPa : 775

Rack travel in m: 12.70...13.10

START CUT-OUT

1/min: 250 (255) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 625 Del.quantity cm3/ : 290.0...296.0 1000 s: (288.0...298.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

rpm : 400 Speed

Del.quantity cm3/: 150.0...154.0 1000 s: (148.0...156.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.50

rpm : 940...950 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 190.0...230.0

1000 s: (180.0...240.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325 Rack travel in mm : 4.80...5.90 Del.quantity cm3/: 40.0...46.0

1000 s: (38.0...48.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P12

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h1 : 05.10.90 Edition

: 8.8.90 Replaces : ISO-4113 Test oil

: 0 402 746 897 Combination no.

Injection pump

Pump designation : PES6P120A720RS7200 : 0 412 726 833

EP type number

Governor

Governor design. : RQV325...875PA944-12

: 0 421 815 261 Governer no.

Customer-spec. information

: MACK TRUCKS Customer

: EM7-300 Engine

1st version kW : 224.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 3.25...3.35 : (3.20...3.40) Prestroke mm

Rack travel in mm : 11.00...13.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 875 1st speed

Rack travel in mm : 14.00...14.10

Del.guantity cm3/: 25.0...25.2

100 s: (24.8...25.4)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.02nd speed

Rack travel in mm : 5.1...5.5

Del.quantity cm3/: 4.0...4.6 100 s: (3.8...4.8)

cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

1.40...1.60 travel mm

rpm : 450 2nd speed

: 3.30...3.70 travel mm

: 700 3rd speed rpm

: 7.90...8.30 travel mm

: 900 4th speed rpm

9.40...9.60 travel mm 1050

5th speed rom

: 10.60...11.00 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

: 250.0...252.0 : (248.0...254.0) Del.quantity

1000

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED 1st version Control Lever position degrees: 61...69 Testing: 1st rack travel in: 13.00 Speed rpm : 915...925 2nd rack travel in: 4.00 rpm : 1065...1095 Speed 4th rack travel in: 1200 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 8...16 Testing: : 275 Speed rpm Minimum rack trave: 6.00 : 325 Speed rpm Rack travel in mm : 5.10...5.50 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm : ? Torque control curve – 1st version 1st speed rpm : 875 Rack travel in m: 14.00...14.10 nd speed rpm : 510 Rack travel in m: 14.70...14.90 2nd speed 3rd speed rpm : 575 Rack travel in m: 14.70...14.90 4th speed rpm : 450 Rack travel in m: 13.80...14.20 Aneroid/Altitude Compensator Test 1st version Setting : 510 Speed man hPa : 1200 Pressure : 14.70...14.90 Rack travel mm

Measurement  $1/\min : 510$ Speed 1st pressure hPa : -Rack travel in m: 8.70...9.10 2nd pressure hPa : 370 Rack travel in m: 10.30...10.40 3rd pressure hPa : 760 Rack travel in m: 13.30...13.70 START CUT-OUT

1/min : 250 (255) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm: 510
Del.quantity cm3/: 328.0...334.0
1000 s: (326.0...336.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 156.0...160.0 1000 s: (154.0...162.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00 rpm : 915...925 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 190.0...230.0 1000 s: (180.0...240.0) Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325 Rack travel in mm: 5.10...5.50 Del.quantity cm3/: 40.0...46.0 1000 s: (38.0...48.0) cm3 : 8.00Spread 1000 s: (12.00)

Remarks: : MACK # 313GC5188-P10

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension: Sliding-sleeve position = 37.0 mm BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,7 c 4 : 17.09.90 Edition : 12.1.90 Replaces

: ISO-4113 Test oil

Combination no. : 0 402 776 807

Injection pump

Pump designation : PES6P120A720LS7120-2

: 0 412 726 832 EP type number

Governor

Governor design. : RSV350...1050P0A529

: 0 421 835 332 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: OM447 A Engine

: 213.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 9.00...12.00

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 650 1st speed

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 20.2...20.4

100 s: (19.9...20.7)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0Rack travel in mm: 5.6...5.8

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8 100 s: (1.2) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 650 Speed Aneroid pressure h: 650

: 202.0...204.0 Del.quantity 1000 : (199.0...207.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

position degrees: 94...106 Testina: 1st rack travel in: 12.40 rpm : 1080...1090 Speed 2nd rack travel in: 4.00 Speed rpm : 1170...1200 4th rack travel in: 1300 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring : 350 Speed rpm Rack travel in mm : 5.7 Speed rpm : 350 Rack travel in mm : 5.60...5.80 SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00 TORQUE CONTROL Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 13.40...13.60 : 950 2nd speed rpm Rack travel in m: 14.00...14.20 3rd speed rpm : 875 Rack travel in m: 14.50...14.70 4th speed rpm : 750 Rack travel in m: 14.90...15.10 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom hPa : 650 Pressure : 14.00...14.20 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 12.30...12.50 2nd pressure hPa : 400 Rack travel in m: 13.20...13.40 3rd pressure hPa : 850 Rack travel in m: 14.30...14.50 4th pressure hPa : -Rack travel in m: 11.30...11.60 FUEL DELIVERY CHARACTERISTICS 1st version

Control lever

Aneroid pressure h: 1200 : 1030 Speed rpm Del.quantity cm3/: 194.0...197.0 1000 s: (191.0...200.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 1200 Speed rpm Del.quantity cm3/: 219.0...224.0 1000 s: (216.0...227.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Del.quantity cm3/: 144.0...146.0 1000 s: (141.0...149.0) cm3 : 8.00Spread 1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.40 Speed rpm : 1080...1090

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 190.0...210.0 1000 s: (186.0...214.0)

Remarks:

N15

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P20 Edition : 21.06.90

replaces

Calibrating oil : ISO 4113

: VE 4/12F1250 R359 Injection pump : 0 460 424 054 Type number

Customer-specific information

Customer : CUM

Engine : 48TA

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening.

bar : 0.35 pressure

Perforated plate

mm:0.5diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0 x Wall thickness : 2.0 mm: 840.0 x Length

Start of delivery block Piston stroke mm: 1.25

mm: +-0.02(0.06)

Outlet |

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 1100 Charge press. hPa: 1000 Setting value bar: 5.1...6.1

Full-load del. with charge press.:

1/min: 850 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 83.0...84.0

cm3/:4.0Dispersion 1000H: (4.5)

Full-load del. w/out charge press.:

1/min : 500 Speed

Del.quantity cm3/ 1000H.: 53.0...54.0

Low-idle speed regulation:

1/min: 375 Speed

Del.quantity cm3/ 1000H.: 10.0...12.0

cm3/: 5.5 Dispersion

1000H.: (7.0)

Full-load speed regulation:

1/min: 1330 Speed Charge press. hPa: 1000 Del.quantity cm3/ - 1000H: 68.0...74.0

Start:

1/@in: 100 Speed Del.quantity : -mind cm3/1000H.: 80.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400

mm: 2.9...3.9 TD travel

mm: (2.9...3.9)
2nd speed 1/min: 1000
Charge press. hPa: 1000

mm: 0.9...1.7 mm: (0.6...2.0) TD travel

1/min: 1100 3rd speed Charge press. hPa: 1000

TD travel mm: 2.0...2.4

mm: (1.5...2.9)

4th speed 1/min: 1250 Charge press. hPa: 1000

TD travel mm: 2.83.6 mm: (2.53.9)	‡	Charge press. hPa: 1000 Del.quantity cm3/: 83.084.0
Supply-pump pressure characteristic:	+	1000H.: (80.586.5) 8th speed 1/min: 700 Charge press
1st speed 1/min: 500 Charge press. hPa: 1000	Ŧ	Charge press. hPa: 535 Del.quantity cm3/: 71.572.5 1000H: (68.076.0) 9th speed 1/min: 500
Supply-pump pressure bar: 2.63.2 2nd speed 1/min: 1000	+	9th speed
Charge press. hPa: 1000 Suppoly-pump	+	Zero delivery (stop):
pressure bar: 4.95.5  3rd speed 1/min: 1100  Charge press. hPa: 1000	++++	Mech. shutoff:
Supply-pump pressure bar: 5.36.2 4th speed 1/min: 1250	+	Speed 1/min: 1250 Del.quantity cm3/: 03 1000H.: -
Charge press. hPa: 1000 Supply-pump pressure bar: 6.06.6	+	Electr. shutoff:
Overflow quantity at overflow valve:	+	Speed 1/min: 375 ELAB volt: -
1st speed	‡	Del.quantity cm3/: 0.03.0 max. 1000H.: -
quantity cm3/10s: (2698) 2nd speed	+	Idle delivery:
Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)	+	1st speed 1/min: 375 Del.quantity cm3/: 1012.0 1000H.: (6.016.0)
Delivery-quant. and breakaway char.:	<u> </u>	2nd speed 1/min: 450 Del.quantity cm3/: 0.02.0 1000H.: -
1st speed 1/min: 700 Charge-air pressure-setting point hPa: 535	+	Automatic starting fuel delivery:
Del.quantity cm3/: 71.572.5 1000H.: (68.076.0)	Ŧ	1st speed 1/min: 130 Del.quantity cm3/: -
2nd speed 1/min: 1500 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0	† † †	ind. 1000H: 80.0 2nd speed 1/min: 250
1000H.: - 3rd speed 1/min: 1430 Charge press. hPa: 1000	†	Del.quantity cm3/: - max. 1000H : 40.0
Del.quantity cm3/: 15.055.0 1000H.: -	+	Shutoff electromagnet:
4th speed 1/min: 1330 Charge press. hPa: 1000 Del.quantity cm3/: 68.074.0	+++++++++++++++++++++++++++++++++++++++	Cut-in min. voltage : 10.0 Rated voltage : 12.0
1000H.: (65.077.0) 5th speed   1/min: 1250 Charge press. hPa: 1000	‡	Mounting and assembly dimensions:
Del.quantity cm3/: 76.579.5 1000H.: (75.081.0)	+	Designation K mm : 3.7 MS mm : 0.81.2
6th speed 1/min: 1100 Charge press. hPa: 1000 Del.quantity cm3/: 77.580.5	Ŧ	SVS max. mm : 2.1 XK mm : 21.823.8
1000H.: (75.582.5) 7th speed 1/min: 850	‡	XL mm : 11.314.7

Remarks:

Operate control lever after each manifold—pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

: CUM 3.9 P25 Test sheet : 21.06.90 Edition

replaces

Calibrating oil : ISO 4113

: VE 4/12F1150 R378 Injection pump : 0 460 424 058 Type number

Customer Part-No.: 3 917 508

Customer-specific information

: CUM Customer

: 4BT 3.9 IND. Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening .

bar: 250...253 pressure

Perforated plate

mm : 0.5diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0 x Wall thickness : 2.0 x Length mm : 840.0

Start of delivery

Prestroke mm: 0.3

(from BDC): +-0.02(0.04)

Start of delivery block mm: 1.8 Piston stroke

 $mm: \leftarrow 0.02(0.06)$ 

Outlet

Injection—pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 900 Speed

N19

Setting value mm: 2.0...2.4

Supply-pump pressure:

1/min: 900

Setting value bar: 4.2...4.8

Full-load del. w/out charge press.:

1/min : 900Speed

Del.quantity cm3/

1000H.: 67.0...68.0

cm3/: 4.0Dispersion

1000H.: (4.5)

Low-idle speed regulation:

1/min: 375 Speed

Del.quantity cm3/

1000H.: 8.0...14.0 cm3/: 5.5

Dispersion

1000H.: (7.0)

Full-load speed regulation:

1/min: 1190 Speed

Del.quantity cm3/ 1000H: 47.0...53.0

Start:

1/min: 100 Speed

Del.quantity

mind cm3/1000H.: 70.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 750 1st speed

mm: 1.8...2.6 mm: (0.5...1.9) TD travel

1/min: 900 2nd speed

mm: 2.0...2.4 TD travel

mm: (1.5...2.9)

1/min: 1150 3rd speed

TD travel mm: 3.2...4.0

mm: (2.9...4.3)

Supply-pump pressure characteristic:

1/min: 500 1st speed

amuq-yjaqu2

bar: 2.5...3.1 pressure

2nd speed 1/min: 900

Supply-pump

bar: 4.2...4.8 pressure

1/min: 1150 3rd speed

Supply-pump bar: 5.2...5.8 pressure Overflow quantity at overflow valve: 1st speed 1/min: 500 : 41...83 Oveflow cm3/10s: (26...98) quantity 1/min: 1150 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: 1300 Del.quantity cm3/: 0.0...3.0 1000H.: -1/min: 1220 2nd speed Del.quantity cm3/: 15.0...55.0 1000H.: -1/min: 1190 3rd speed cm3/: 47.0...53.0 Del.quantity 1000H.: (44.0...56.0) 1/min: 1150 4th speed Del.quantity cm3/: 63.5...66.5 1000H.: (62.0...68.0) 1/min: 900 5th speed 1/min: 750 6th speed cm3/: 69.5...73.5 1000H.: (67.5...75.5) 1/min: 500 Del.quantity 7th speed Del.quantity cm3/: 68.0...76.0 1000H.: (66.0...78.0) Zero delivery (stop): Mech. shutoff: 1/min: 1150 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 375 Speed ELAB volt: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: -Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: 8.0...14.0 1000H.: (6.0...16.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.0...4.0 1000H.: -

Automatic starting fuel delivery:

2nd speed 1/min: 240 Del.quantity cm3/: - max. 1000H: 80.0

Shutoff electromagnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : KF mm : 5.0...5.4
MS mm : 1.1...1.3
SVS max. mm : 4.0

Remarks:

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

: CUM 3.9 N20 Test sheet Edition : 24.10.89

replaces Calibrating oil : ISO 4113

: VE 4/12F1150 R378 Injection pump

: 0 460 424 058 Type number

Customer-specific information

Customer : CDC

: 4 BT - 3.9 IND. Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Openina .

bar: 250...253 pressure

Perforated-plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter x Wall thickness mm: 840 x Length

Start of delivery

mm:0.3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.8

mm: +-0.02(0.06)

: A Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 900

Setting value mm: 2.0...2.4

Supply-pump pressure:

1/min: 900 Speed

Setting value bar: 4.2...4.8

Full-load del. w/out charge press.:

 $1/\min : 900$ Speed

Deliquantity cm3/

1000H.: 67.0...68.0

Dispersion cm3/: 4.0

1000H.: (4.5)

Low-idle speed regulation:

1/min: 375 Speed

Speed Del.quantity cm3/ 1000H.: 8.0...14.0 cm3/: 5.5Dispersion 1000H.: (7.0)

Full-load speed regulation:

1/min: 1190 Speed

Del.quantity cm3/ 1000H: 47.0...53.0

Start:

1/min: 100 Speed Del.quantity

cm3/1000H.: 70.0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750

mm: 0.8...1.6 mm: (0.5...1.9) TD travel

1/min: 900 mm: 2.0...2.4 mm: (1.5...2.9)

2nd speed

TD travel

3rd speed 1/min: 1150

TD travel mm: 3.2...4.0

mm: (2.9...4.3)

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

pressure

bar: 2.5...3.1 bar: (2.3...3.3)

1/min: 900 2nd speed

Supply-pump

bar: 4.2...4.8 pressure

bar: (4.0...5.0)

Supply-pump bar: 5.2...5.8 pressure bar: (5.0...6.0)Overflow quantity at overflow valve: 1st speed 1/miru: 500 : 41...83 Oveflow quantity cm3/10s: (26...98) 1/min: 1150 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 1300 1st speed Del.quantity cm3/: 0.0...3.U 1000H.: (0.0...3.0) 1/min: 1220 2nd speed cm3/: 15.0...55.0 Del.quantity 1000H.: (15.0...55.0) 1/min: 1190 3rd speed Del.quantity cm3/: 47.0...53.0 1000H.: (44.0...56.0) 1/min: 1150 4th speed Del.quantity cm3/: 63.5...66.5 1000H.: (62.0....68.0) 1/min: 900 5th speed Del.quantity cm3/: 67.0...68.0 1000H.: (64.5...70.5) 1/min: 750 6th speed cm3/: 69.5...73.5 Del quantity 1000H.: (67.5...77.5) 1/min: 500 7th speed Del.quantity cm3/: 68.0...76.0 1000H.: (66.0...78.0) Zero delivery (stop): Mech. shutoff: 1/min: 1150 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 375 Speed ELAB volt: -Del.quantity cm3/: 0.0...3.0 1000H.: max. Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: 8.0...14.0 1000H.: (6.0...16.0) 1/min: 500 2nd speed

1/min: 1150

3rd speed

Del.quantity cm3/: 0.0...4.0 1000H.: (0.0...4.0) Automatic starting fuel delivery:

1st speed 1/min: 130 Del.quantity cm3/: ind. 1000H: 80.0

2nd speed 1/min: 240 Del.quantity cm3/: max. 1000H: 80.0

Mounting and assembly dimensions:

Remarks: : C.D.C. # 391 7507

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

: CUM 3.9 P31 Test sheet Edition : 22.06.90

replaces

Calibrating oil : ISO 4113

: VE 4/12F1050 R389 Injection pump : 0 460 424 065 Type number

Customer Part-No.: 3 917 517

Customer-specific information

: CUM Customer

: 4BT-390 AUTOM. Engine

Power k: 78 Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating oil return temp. °C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250...253 pressure

Perforated-plate

mm:0.5diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0 x Wall thickness : 2.0 mm : 840.0x Length

Start of delivery

mm: 0.2 Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.0

mm: +-0.02(0.06)

: A Outlet

Injection-pump setting values Test specifications in parentheses Timing-device travel:

1/min: 750 Speed Charge press. hPa: 1000

Setting value mm: 3.4...3.8

Supply-pump pressure:

1/min: 750 Speed Charge press. hPa: 1000 Setting value bar: 5.0...5.6

Full-load del. with charge press.:

1/min: 750 Speed Charge press. hPa: 1000

Del.quantity cm3/ 1000H.: 89.5...90.5

cm3/: 4.0 1000H: (4.5) Dispersion

Full-load del. w/out charge press.:

1/min: 500 Speed

Del.quantity cm3/

1000H.: 63.5...64.5

Low-idle speed regulation:

1/min: 375 Speed

Del.quantity cm3/ 1000H.: 8.0...14.0

cm3/: 5.5Dispersion

1000H.: (7.0)

Full-load speed regulation:

1/min: 1100 Speed Charge press. hPa: 1000

Del.quantity cm3/

1000H: 59.0...65.0

Start:

1/min: 100 Speed Del.guantity cm3/1000H.: 60.0

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 500 1st speed Charge press. hPa: 1000

mm: 1.7...2.5 TD travel

mm: (1.4...2.8) 1/min: 750

2nd speed Charge press. hPa: 1000

TD travel mm: 3.43.8 mm: (2.94.3)  3rd speed 1/min: 1050 Charge press. hPa: 1000 TD travel mm: 4.75.5 mm: (4.45.8)	Charge press. hPa: 350 Del.quantity cm3/: 79.580.5 1000H.: (76.084.0) Bth speed 1/min: 500 Del.quantity cm3/: 63.564.5 1000H: (60.068.0)
Supply-pump pressure characteristic:	Zero delivery (stop):
1st speed 1/min: 500 Charge press. hPa: 1000 Supply-pump pressure bar: 3.94.5 2nd speed 1/min: 750 Charge press. hPa: 1000 Supply-pump	Mech. shutoff:  Speed 1/min: 1050 Del.quantity cm3/: 03 1000H.: -  Electr. shutoff:
pressure bar: 5.05.6  3rd speed 1/min: 1050 Charge press. hPa: 1000 Supply-pump pressure bar: 6.36.9	Speed 1/min: 375 - ELAB volt: - Del.quantity cm3/: 0.03.0 - max. 1000H.: -
Overflow quantity at overflow valve:	Idle delivery:
1st speed 1/min: 500 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)	1st speed 1/min: 375 Del.quantity cm3/: 8.014.0 1000H.: (6.016.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.04.0 1000H.: -
Delivery-quant. and breakaway char.:	Automatic starting fuel delivery:
1st speed 1/min: 700 Charge-air pressure-setting point hPa: 350 Del.quantity cm3/: 79.580.5	1st speed 1/min: 130  Del.quantity cm3/: -  ind. 1000H: 60.0  2nd speed 1/min: 230
1000H.: (76.084.0)  2nd speed 1/min: 1180	Del.quantity cm3/: - + max. 1000H: 60.0
Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0 1000H.: -	Shutoff electromagnet:
3rd speed 1/min: 1120 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0 1000H.: -	Cut-in min. voltage : 10.0 Rated voltage : 12.0
4th speed 1/min: 1100 Charge press. hPa: 1000 Del.quantity cm3/: 59.065.0	Mounting and assembly dimensions:  Designation
1000H.: (56.068.0)  5th speed 1/min: 1050  Charge press. hPa: 1000  Del.quantity cm3/: 76.579.5  1000H.: (75.081.0)	+ K mm : - + KF mm : 5.66.0 + MS mm : 0.91.3 + SVS max. mm : 2.2
6th speed 1/min: 750 Charge press. hPa: 1000 Del.quantity cm3/: 89.590.5 1000H.: (87.093.0)	Remarks:  Operate control lever after each manifold-pressure compensator pressure
7th speed 1/min: 700	+ change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket